An Examination of Predictors of Quality of Life for People with Chronic Pain

by

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I certify that the work contained herein is a true reflection of the work carried out

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Abstract

Chronic pain in the UK is a sizeable problem for the health service. Back pain in particular is one of the most costly conditions for which an economic analysis is available in terms of days lost from employment and in social security benefits. Chronic pain impacts negatively on quality of life and has high personal costs in terms of pain related disability. Disability impacts negatively on psychological status and well-being, social interactions and economic or vocational status.

Psychological management of chronic pain involves increasing individuals' levels of functional activity, thereby reducing pain related disability. The overall aim of this study, therefore, was to establish whether overall quality of life was significantly poorer for individuals with chronic pain than those with another chronic condition. The secondary aim of this study was to identify specific predictors of functional activity for individuals with chronic pain. Possible predictors were hypothesised to include mood, employment status, and social support, but not pain.

Fifty consecutive participants with chronic pain attending their first appointment at one of two pain clinics, were assessed by self report questionnaire on measures of quality of life, functional status, mood, social support and pain. A control group of forty-five participants with chronic diabetes attending a follow-up appointment at a diabetes clinic were also assessed by self report questionnaire on all measures except pain.

Results are discussed with reference to previous research findings.

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1 Introduction

1.1 Rationale for the Study of Chronic Pain

This study sets out to examine overall quality of life for people with chronic pain. There are different approaches to the study of quality of life. The most notable of these is the distinction between overall quality of life and health-related quality of life. In terms of the study of chronic pain, this is an important distinction to make. This is because people with chronic pain do not form one single medically definable group. They may have pain as a principle defining feature of their condition, but may not know the cause of that pain. This raises the question of whether it is more appropriate to study health-related quality of life or quality of life more generally. The distinction between health-related and overall quality of life measurement will be examined in more detail in 1.3 below.

The case of back pain illustrates the distinction between quality of life measures, made above. Back pain is a symptom not a disease. Back pain may be a symptom of serious spinal pathology or a symptom of normal 'wear and tear' (Waddell, 1998). Spinal pathology may be caused, for example, by a tumour or disease process such as osteoporosis. Back pain therefore, links bodily symptoms, serious disease, and disability. Data from the South Manchester Study provide some evidence of the pervasiveness of back pain in the UK (Waddell, op cit). The study was a community survey of 4,500

people aged 18-75. The aim of the study was to investigate patterns and predictors of back pain as well as general healthcare use. Results indicated a one-month prevalence of back pain in the community of 39 percent and lifetime prevalence of 58 percent. Back pain, therefore, is a common occurrence (Waddell, 1998).

Within the overall sample in the South Manchester Study, participants could be categorised into three groups based on their pain history. These groups were firstly, people who were pain free over the previous twelve months (62 percent), people with intermittent pain (32 percent) and people with long-standing or seriously disabling pain (6 percent) (Waddell, op cit). However, it is important to note that seriously disabling pain is not necessarily pain due to serious spinal pathology.

Lathan & Davis (1994) carried out a review of research in order to demonstrate the socio-economic impact of chronic pain. The authors reported on a survey carried out by the Pain Society of Great Britain. This survey found that 41 percent of registered disabled people suffered from chronic pain. This gives an estimate of six million people across the UK with chronic pain. A registered disabled group, however, are not necessarily representative of the general population. Latham & Davis (op cit) also found prevalence rates of chronic pain in community samples ranging from 9 percent to 11 percent.

There are medical conditions where pain is a central feature of the presentation of the condition. Many of these are located within a rheumatological group of disorders, for example osteoarthristis, fibromyalgia, and osteoporosis with secondary osteoarthritis. Pain from these disorders may be experienced in any major body part associated with joints. These include, for example, pain in the hand, wrist, neck, shoulder, arm, hip, knees and feet (Snaith, 1996).

To take fibromyalgia as an example, the principle clinical features are firstly, pain, principally in the neck and back, but may be whole body pain. Other clinical features include fatigue, poor sleep, headache and urinary frequency. The prevalence of fibromyalgia syndrome in rheumatology clinics was estimated at 20 percent, and in 2 percent of general practitioner (GP) practices. Symptoms overlap in presentation with other syndromes such as myelgic encephalomyelitis (ME), fibrositis, tension headache, and irritable bowel syndrome (Dohery & Jones, 1996).

In summary, It is important, therefore, to acknowledge the distinctions in pain conditions in terms of aetiology because of the impact this may have on health-related and overall quality of life. This study encompasses an examination of the experience of pain due to any cause, or indeed to an unknown cause, in any part of the body. Back pain, however, is a feature of

'non-malignant' conditions as well as recognisable medical disorders as outlined above. Back pain also has high prevalence rates in the community. As a result, much of the background research to this study concentrated on back pain. The next section, therefore, examines evidence of the economic burden of back pain.

1.2 Economic Burden of Back Pain

Maniadakis & Gray (2000) carried out an analysis of the economic burden of back pain in the UK. They stated that 'cost-of-illness' studies are of value because they indicate the relative significance of medical conditions in economic terms. With this information it is possible to target health research on those areas where the burden of disease is greatest. It is also possible with this information to monitor the impact of health policies over time that were designed to reduce the economic burden of a particular disease.

Maniadakis & Gray (2000) reviewed the prevalence rates of back pain in the UK and found that these range from 49 percent to 80 percent. They also found evidence that disability due to back pain rose by 104 percent during the period 1986-1992 compared with disability for other reasons, which rose by 60 percent during the same period. Maniadakis & Gray (2000) estimated the annual economic cost of back pain for the UK. This estimation was extrapolated to the UK using data from England and Wales. Employment costs were quantified as production lost directly due to absenteeism or

indirectly due to caring for someone with back pain. Compensation costs were not included.

The authors gathered information from a random and representative sample of 6000 adults on their condition and how it affected them. They found that between 1994 and 1995 there were 116 million days of certified incapacity to work related to back pain. These overall figures were comprised of 75.5 million days for men and 40.5 million days for women. This implies that £9,090 million was lost due to incapacity to work in terms of production. Some of this reduces over time as vacancies due to back pain absence are subsequently filled. However, this still places back pain as one of the most costly conditions for which an economic analysis is available in the UK, alongside medical conditions such as heart disease.

The key difference for back pain is that it is not a life threatening problem or illness unlike problems related to heart disease. These are high economic costs for a condition which has low morbidity. There is also little likelihood of a long term permanent treatment for back pain. The purpose of comparing costs of back pain with heart disease is to highlight the degree of severity of the condition. Because back pain is not life threatening there has been less investment in helping people to manage their condition than there has been for life threatening conditions with a clear treatment path (Waddell, 1998).

Nachemson (1994) assessed the economic burden of back pain on the Swedish economy in terms of costs from insurance and social security benefits. The benefits system in Sweden at the time of Nachemson's analysis provided 80 percent of salary for one year in benefits after one week's sickness absence from work. Nachemson (op cit) estimated that 30 percent to 40 percent of the population aged ten to sixty-five reported back pain on a monthly basis. In one percent to eight percent of this group this was work disabling back pain. Nachemson (op cit) argued that the overall cost of benefits, and in particular those paid for permanent disability, threatens the economies of Sweden and other European countries.

In Sweden, 50 percent of people with a permanent disability suffered from non-specific pain syndromes of which back pain was the most common diagnosis. In 1987, eight percent of the working population were sick-listed in Sweden, staying off an average of 34 days due to back pain. This compared to one percent in 1970 with an average of 20 days off due to back pain. Further, the period between 1970 and 1987 saw a 6000 percent increase in Sweden in the number of people receiving permanent disability pensions for back pain.

In summary, the economic burden of pain can be measured in terms of losses in productivity due to sickness absence from work. Significant family members may also take time off work in order to care for a person with back

pain. Costs in terms of sickness and disability social security benefits are also significant. However, economic burden is only one measure of the impact of a medical condition on society and its citizens. A burden more personal to the individual is the impact of chronic pain on quality of life. The next section examines the concept of quality of life.

1.3 Defining Quality of Life

Mead, Van Den Boom & Van Dam (1994) discussed the concept of quality of life in terms of its application to psychological study. They stated that quality of life is a hypothetical construct that needs to be operationalised before it has any meaning. Research into quality of life originated as an outgrowth of drug trials where medical professionals were concerned primarily with disease oriented outcomes. This can be compared to patient concerns which are likely to be related more to the impact of therapies on their daily lives. Quality of life is viewed by these authors as not only the absence of distress, illness, symptoms and complaints, but also a positive attribution of the meaning of life.

This view concurs with the World Health Organisation's definition of health which is, "...a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (Spiker, 1996). One value of measuring quality of life in health, therefore, is to help estimate the burden of specific diseases on functioning and well-being in addition to improving the

improving the quality of a patient's treatment and outcome. It is also helpful in differentiating between two therapies with marginal differences in mortality and morbidity when compared on cost-effective terms.

Spiker (1996) reviewed quality of life measures used in clinical trials. Five broad domains can be identified in health-related quality of life research as follows:

1) physical status and functional abilities,

2) psychological status and well-being,

3) social interactions,

4) economic and/or vocational status factors, and

5) religious and/or spiritual status.

Spiker (op cit) acknowledged that criticisms have been made that not all domains may be relevant to all areas of research. In counter argument, Spiker (op cit) stated that although no 'a priori' reason exists to include all components, this is the only way to ensure that nothing is missed.

Schipper, Clinch & Olweny (1996) also discussed conceptual issues in quality of life research. They stated that current conceptual formation of quality of life in a clinical setting defines quality of life functionally by the patients' perceptions in four areas. These are 1) physical and occupational,

2) psychological, 3) social, and 4) somatic. In this model, the patient serves as his or her own control. A patient would make a comparison against his or her own expectation of function in each of these areas. Hence, this highlights the subjective nature of quality of life.

From an operational perspective, quality of life is a multifactorial construct according to Schipper et al (op cit). The component parts of the construct should remain consistent across populations. However, the individual significance of each component part of the construct may vary over time. Schipper et al (op cit) identified five key concepts that emerged over time. Those relevant to this investigation are the psychological view of quality of life and the 'proxy' to quality of life associated with re-integration to normal living.

The psychological view of quality of life, according to Schipper et al (1996), reflects the patient-perceived illness side of the distinction between illness and disease. Contributory factors in the illness experience include perception of symptoms, labelling of symptoms, distress, inability to function 'normally' and methods of coping used by patients and families. In chronically ill people, dealing only with a disease process may be inadequate because disease problems may be amplified by psychosocial responses to symptoms. Operationally this means that physiological and psychological states are not independent of one another. The experience of

individuals with chronic pain, however, is more related to a disabling process than a disease process (Waddell, 1998).

Shipper et al (1996) proposed that re-integration into normal living is a proxy for quality of life and may be more relevant to individuals with chronic pain. It refers to the reorganisation of physical, psychological and social characteristics of an individual into a harmonious whole. This is not an identical concept to quality of life but is a useful way of viewing chronic conditions. Re-integration refers to an ability to do what one wants to do without necessarily being free from disease or symptoms.

In terms of measuring quality of life, Schipper et al (1996) contends that the concept is subjective in two senses. Firstly, many dimensions are not objectively measurable. Secondly, measurement of quality of life is as concerned with the patients' view of the importance of the dysfunction as with its objective existence. This subjectivity is thought to circumvent two limitations in measurement of quality of life. One is that quality of life can be assessed within different cultures. The other is that patients serve as their own baseline in terms of assessment as quality of life is a lifelong continuous variable.

The World Health Organisation (WHO) set up a system of international collaboration over several years in order to develop a reliable and valid tool

for measuring quality of life across different cultures (WHOQOL Group 1998a). Quality of life was accepted as a multidimensional concept including both positive and negative aspects and is a subjective expression by the individual (Saxena & Orley, 1997).

The WHO defined quality of life as,

"... individuals' perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence social relationships and their relationship to salient features of their environment", (Saxena & Orley, 1997).

The collaborative nature of the WHO investigation resulted in facets of quality of life being included based on a consensus within and between cultures. Also, views amongst health professionals, healthy members of the general public, and healthcare users were also central to the process (WHOQOL Group, 1998a). Hence, while the WHO definition of quality of life has remained the same since its original conceptualisation, the particular facet of spirituality, personal beliefs and religion within the overall measurement tool was added at the insistence of non-professional contributors (Saxena & Orley, 1997).

The WHO (1998a) definition of quality of life can be applied to a study of a chronic pain population. There is evidence that an individual's health outcome in chronic pain is related to their level of disability and this evidence will be addressed below. This may be pivotal in the study of chronic pain because level of disability, intuitively at least, may impact on all the facets of quality of life outlined by the WHO (1998a). Hence, assessment will be made of overall quality of life in the present study as opposed to health-related quality of life. It is necessary, however, to also be clear on what is meant by disability, and this follows later in 1.5 below. In the first instance, a review of research follows which has applied quality of life measures to the assessment of individuals with chronic pain.

1.4 Quality of Life and Chronic Pain

As stated earlier, there is an important distinction to make when assessing quality of life. Factors important to health-related quality of life may differ from factors important to overall quality of life. The concept of health-related quality of life is linked to a definition of health. The World Health Organisation definition of health is, "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity", (Schipper, Clinch & Olweny, 1996). Quality of life in relation to health, therefore, "represents the functional effect of an illness and its consequent therapy upon a patient as perceived by the patient", according to Schipper et al (1996). This definition is based upon the idea that the goal of medicine is

to reduce or eliminate morbidity and mortality of a particular disease. Overall quality of life, in contrast, encompasses more than medically definable outcomes. Evidence from research using both of these concepts is reviewed below.

According to Patrick, Deyo, Atlas & Singer et al (1995), recovery from chronic pain, or morbidity due to chronic pain is rare. Hence, it is important to assess health-related quality of life in order to understand the nature of chronic pain conditions. This in turn may help assess treatment effectiveness. It may also contribute towards the development of health and disability policy.

Patrick et al (op cit) analysed health-related quality of life measures completed by people with chronic low back pain. The aim of their study was to determine which of several measures of health-related quality of life were most responsive to change over a short period of time following an intervention. The authors tested several measures of health-related quality of life, both standardised and unstandardised. These included frequency of pain symptoms and how bothersome these symptoms were, and measurement of functional status, and disability. Participants were 427 patients with back pain who received a pain management intervention.

Results showed that the most responsive health status measure of change over a three month period was the pain component of the short form 36 health status questionnaire (SF-36). A standardised back pain disability questionnaire was equally as responsive. This was followed closely by the physical functioning component of the SF-36.

Participants with a history of more treatment for back pain reported poorer health-related quality of life. Length of time having a back pain condition, however, was not related to health-related quality of life. Lower functional status and increased disability both indicated poorer health-related quality of life. Overall, standardised questionnaires which assessed symptom frequency or severity, functional status, and well-being, were more responsive to changes in clinical status than unstandardised measures of work loss days, or number of days of bed rest or inactivity.

Becker, Thomson, Olsen, & Sjogren et al (1997) examined health-related quality of life in 150 chronic non-malignant pain patients in Denmark. Again, health-related quality of life was measured using the SF-36. Mood and psychological well-being were also assessed. Results showed statistically significant but modest negative correlations between pain severity and health-related quality of life. In comparison with a healthy control group, pain patients had significantly poorer health-related quality of life scores. Results also showed that 58 percent of the participants had a depressive

disorder. Further, psychological and social well-being were highly correlated.

Hopman-Rock, Kraaimaat & Bijlsma (1997) assessed quality of life in older adults aged 55-74 who had osteoarthritic pain of the knee or hip joints. Patient data was compared with healthy controls. A visual analogue scale was devised to measure global quality of life as opposed to health-related quality of life. This global assessment was examined in relation to a number of subdomains. These included physical functioning, psychological functioning, judgement of own health and happiness in the last month. The authors also assessed the possible mediating and moderating effects of disability and coping on quality of life.

Overall, results showed within the patient group, that those with more severe chronic pain had poorer quality of life. In comparison with healthy controls, quality of life scores were 10 percent lower for patients. Both physical disability and psychosocial disability were negatively associated with quality of life. Furthermore, physical and psychosocial disability were mediating variables in the relationship between pain and quality of life.

Hopman-Rock et al (1997) speculated that chronic pain may cause more physical and psychosocial disability resulting in poorer quality of life. Alternatively, a lower global quality of life may contribute to psychosocial

disability which may in turn amplify the pain experience. In line with this latter point, participants rated well-being as more important to them in the concept of quality of life than either physical or psychosocial functioning in general.

Skevington (1998) carried out a UK study of quality of life for individuals with chronic pain and measured quality of life in relation to health using the long form of the World Health Organization Quality of Life Scale. Results showed that pain affected all domains with the exception of spirituality. Negative feelings were most associated with increased pain and discomfort. Longer duration of pain was also associated with reduced quality of life. Individuals in comparison who were pain free had significantly better quality of life in relation to health.

In summary, from the evidence reviewed above, health-related quality of life is related to pain, functional status, disability and mood. Global quality of life is also related to pain and physical disability. In addition, psychosocial disability is related to global quality of life. The next section, therefore, examines the relationship between pain and disability more closely.

1.5 Relationship between Pain and Disability

In both clinical terms and for research purposes, Waddell (1996) stated that it is essential to distinguish the experience of pain from disability. As stated

earlier, at its simplest level, pain is a symptom, not a clinical sign, diagnosis or disease. Disability in contrast refers to restricted function. Therefore, the experience of pain and being disabled by that pain are not one and the same. The goal of treatment for chronic pain, i.e. pain management, is to reduce disability and, therefore, increase function. The terms disability and function, therefore, are used interchangeably as two sides of the same coin.

The definition of pain according to the International Association for the Study of Pain is, "... an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage", (Merskey, 1979). There are a number of important clinical implications of this definition as follows:

1 pain is always a conscious state and, therefore, needs always to be assessed by the individual and acted upon at a conscious level,

2 the definition avoids linking pain to a known stimulus, therefore affirming for the individual that the pain is accepted as real even in the absence of a known stimulus,

3 the definition lays equal weight on both sensory and emotional features of the pain experience,

4 pain is defined as a subjective and personal experience encompassing past experiences and current mental and emotional states,

5 the definition allows for both actual and anticipated events to be contributory factors in an individual's pain experience, and

6 the emphasis on the subjective nature of pain highlights the potential difficulty individuals may have in communicating it to others.

Acute pain is usually understood as pain lasting fewer than three months in duration. Chronic pain varies from a continuous period of three months, to sporadic and intermittent pain over a six month period or longer (Waddell, 1998). The key clinical features of chronic pain, however, are not its duration, but rather its persistence beyond expected recovery time and its intractable nature. For research purposes, a six month period will be used, whether the pain is constant and unremitting or intermittent.

The relationship between acute pain and disability is usually found to be in proportion to the extent of physical findings, such as measurable stimuli resulting in a sensory experience. In acute pain and disability, therefore, management of pain and disability clinically is generally viewed as straightforward (Waddell, op cit).

In contrast, the clinical presentation of chronic pain and disability suggests that the level of disability becomes dissociated from the original physical problem. Furthermore, continued attempts to treat tissue damage have been found not only to fail to relieve pain symptoms but also to perpetuate the problem of disability (Wadell, op cit).

This makes intuitive sense given the earlier definition of pain, which was described in terms of both a sensory and an emotional experience. Waddell (1996) stated that reports of pain are complex. Reports vary because of a number of factors. These include the level of distress, previous encounters with health professionals, social and cultural influences, the impact of past treatment and current expectations of further treatment.

In contrast, clinical assessment of disability is potentially clearer than that of pain. This is because reports of disability involve a description of concrete events. One way to do this is to base the assessment on movements associated with activities of daily living. This would involve, for example, an assessment of bending, lifting, sitting, standing or walking. The focus of this type of assessment is on the extent to which various activities are limited or which require help from others. This is a usual form of assessment for individuals with chronic pain (Waddell, 1998). A less medical form of assessment might be of activities of daily living, for example, functions that are essential for self care, or instrumental activities of daily living, for

example, self reliant functions such as shopping, cleaning, and preparing meals (Kempen & Suurmeijer, 1990).

The WHO definition of disability is, "...any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being", (WHO, 1980). Waddell (op cit) states that this definition makes several problematic assumptions. Firstly, the definition assumes that it is normal to have no disability or restriction of any kind. Secondly, it assumes that disability occurs as a result of impairment. Thirdly, it assumes that disability is restricted ability.

Waddell (op cit) stated that this type of working definition is of use mainly for the purposes of compensation or assessment of capacity for work. Nonetheless, taking these criticisms aside, it remains possible for individuals to report their level of disability because the language for doing so is more readily available to them than for pain. The report of disability or limits on function remain subjective but nonetheless are more easily quantified, for example being restricted in walking to 10 minutes, 20 minutes or 30 minutes at one time.

Methods other than self-reported levels of functioning have also been used to assess levels of pain-related disability (Fogg & Taylor, 1997). A functional capacity evaluation represents an attempt to gain an objective

rather than subjective measure of disability by independent observation. Whole body ability in terms of limitations in cardiovascular fitness and lifting capacity are two examples of this. However, functional capacity evaluations are criticised for not being wholly objective. They are more of an evaluation of performance than capacity. As such, they depend heavily on the individual expending sufficient effort.

Work loss has also been identified as an important measure of low back disability. This is despite being only weakly related to clinical measures of pain and disability. Work loss has been found to measure more severe disability. Lesser degrees of disability are more likely to result in sickness absence. Sickness absence may lead to a change in work duties, and lower productivity, loss of overtime and loss of promotion. Further, work loss and return to work also depend on other influences. These include job demands and conditions, ability to modify jobs, and job satisfaction (Waddell, 1998). Fordyce (1995) found in a review on low back pain disability that work loss currently is the single most important social measure of low back disability and health care. Clearly, work loss results in more than financial stresses. Other outcomes from work loss include potential reductions in status, social network and structure to the day.

A recent model developed to explain the disabling nature of low back pain is the biopsychosocial model (Waddell, 1998). This model takes into account

the sensory processing of pain, emotional processing, behaviour outcomes and illness behaviour, and outcomes of social interactions which may also be reinforcing agents of illness behaviour. The symptom of back pain is viewed as having arisen as a result of an overload on the musculoskeletal system (sensory processing). This may be due to an increased load on the system or due to the system being generally less able to cope. Physical problems may affect people's beliefs and expectations about their pain. Distress may result and in turn increase awareness of physical sensation (emotional processing). Behaviour will in turn be affected (behaviour outcome) and reinforced by social interactions with others (social outcome) (Waddell & Main, 1998).

In summary, the pain experience for people with chronic pain becomes separated from the disability experience. Pain related disability differs from a general notion of disability because it is not necessarily caused by a physical impairment. Nonetheless there are potentially significant social sequelae to pain related disability such as loss of work. The next section addresses the psychological factors that may be contributory factors to, as well as outcomes of, pain related disability. These factors will also be relevant, therefore, to the assessment of quality of life in chronic pain.

1.6 Negative Affect and Chronic Pain

As stated earlier, the biopsychosocial model of chronic pain suggests that affective states are contributory factors in an individual's pain experience. Negative affect includes symptoms of depressed mood, anxiety and anger. This section reviews the evidence for the contribution of negative affect to the experience of chronic pain.

Banks & Kerns (1996) reviewed the prevalence rates of chronic pain co-occurring with depression. Lifetime prevalence estimates of chronic pain and symptoms of depression ranged from 10 percent to 100 percent. However, when standardised diagnostic criteria for a major depressive disorder were applied to the analysis, lifetime prevalence estimates dropped to a range of 30 percent to 54 percent. In comparison, estimates of lifetime prevalence rates of major depressive disorder in the general population without chronic pain are five percent to 27 percent. Further, a linear increase of prevalence of major depressive disorder was documented from community samples, primary care, and medical samples.

The prevalence of depression with chronic pain was also found to be higher than with other chronic medical conditions. Among patients with cardiac disease, 14 percent had depression three to four months following a myocardial infarction. Among stroke patients, seven percent had depression 17 months post-stroke (Banks & Kerns, op cit).

Friedman, Vila, Timsit & Boitard et al (1998) found a lifetime prevalence rate of major depressive disorder of zero percent in men and four-and-a-half percent in women with insulin dependent diabetes. The mean number of years the participants had been diagnosed with diabetes was 11, ranging from 7 to 15 years.

Roy, Collier & Roy (1994) also assessed the presence of depressive symptoms in a patient group with insulin-dependent diabetes. This group also had significant eye disease problems associated with diabetes. The mean duration of diabetes in the sample was 13 years, ranging from 9 to 17 years. Results showed that one patient out of twenty was diagnosed by psychiatric interview with a major depressive disorder and three others had a past history of depression. This represents a lifetime prevalence rate of 20 percent in this sample.

Lustman, Clouse, Griffith & Carney et al (1997) screened for depression using the Beck Depression Inventory (BDI) in a mixed insulin dependent and non-dependent diabetes sample. They found that 37 percent of patients (n=63) satisfied criteria for depression on the BDI. However, the BDI has been criticised for high loading of somatic items which may inflate rates of depression in physical illness.

There are a number of difficulties involved in making comparisons between groups of people with chronic medical conditions in relation to symptoms of depression. There is a problem of overlapping somatic symptoms in chronic pain and depression. Assessment of depressive symptoms, therefore, requires cautious use of somatic symptoms for diagnostic purposes, or the use of rating scales that limit the use of somatic symptoms (Banks & Kerns, 1996). Lustman et al (1997) addressed the criticism of excessive somatic symptoms on the BDI which may inflate their results. They found that all the somatic symptoms except weight loss appeared more prevalent in depressed than non-depressed patients. However, the authors did not test the significance of this finding. Therefore, the prevalence of depression may be an overestimate in Lustman et al's (op cit) analysis.

Assessment of mood also needs to take into account the point in time when mood is assessed. As stated earlier, by definition, the term chronic pain refers to pain that is experienced for a minimum six month period. In addition to the six month criterion, however, Banks & Kerns (op cit) stated that the most appropriate comparison for chronic pain samples is with individuals who are stable in their chronic condition at the time of the assessment.

There is also some debate over the temporal relationship between chronic pain and depressed mood. Three possible links between chronic pain and depression suggested by Banks & Kerns (op cit) are as follows:

1) depression precedes chronic pain, which in turn increases pain sensitivity and lowers pain thresholds,
2) depression co-occurs with pain because of common underlying psychological or biological processes, or
3) depression is a psychological reaction to the experience of pain.

Banks & Kerns (op cit) examined existing evidence to determine which of the three possible links between depression and chronic pain were most conclusive. Atkinson, Slater, Patterson & Grant et al (1991) found that the majority of patients with chronic pain and depression reported the onset of depression more than two years following the onset of pain. Of those patients with primary depression who subsequently developed pain, only 15 percent developed pain less than two years after the onset of depression. Depressed mood, therefore, was unlikely to have elicited pain. The evidence appeared more likely to support the link that pain either causes or promotes depressed mood, especially two years post onset of pain.

Gaskin, Greene, Robinson & Geisser (1992) examined the predictive ability of anxiety, anger and depression in self reported clinical pain. They found

that 'state' measures of affect were more strongly related to pain than 'trait' measures. This suggests again that pain adversely impacts on mood rather than negative mood predisposing the development of pain. Specific results were that depression scores were the single most significant predictor of evaluative pain and present pain intensity ratings. Also, state anxiety and state anger together predicted 38 percent of the variance of scores on affective pain scales.

Banks & Kerns (op cit) reviewed a number of psychological models that help explain some of the relationship between chronic pain and depression. Beck's (1976) cognitive distortion model proposed that some individuals are prone to depression because they have developed negatively biased cognitive schemas of themselves and of events. These negative schemas become activated by stressful events. These result in distortions of perception and errors of logic. This model suggests that some individuals with chronic pain may be vulnerable to depression, which is activated by a pain stressor.

Previous research has found a positive association between the frequency of general and pain specific cognitive errors and symptoms of depression (Holzberg, Robinson, & Geisser, 1993). Holzberg et al (op cit) also found that cognitive distortions were associated with increased disability, increased negative self-statements and negative automatic thoughts. For individuals

with depression without chronic pain, there was evidence to suggest that negative thoughts are a product rather than a precursor of depression (Holzberg et al, op cit). However, in chronic pain the evidence suggests that depression may instead follow on from cognitive distortions (Banks & Kerns, 1996).

Seligman's (1975) learned helplessness model proposed that helplessness ensues following exposure to uncontrollable outcomes. This leads to an expectation for the individual of not being able to control future outcomes. The reformulated helplessness model (Abramson, Seligman & Teasdale, 1978) highlighted the role of interpretation of causality and attributions made about the causality of events. For people with chronic pain, the symptom of pain may be conceptualised as an inescapable aversive experience. An internal, stable and global attributional style was more likely to be found in depressed than non-depressed individuals with chronic pain (Love, 1988). This model lends support, therefore, for the hypothesis that pain causes depression via the way in which the individual appraises their ability to control pain and life in general.

Lewinsohn's (1974) behavioural model proposed that depression is a function of decreases in response-contingent positive reinforcement. For people with chronic pain, positive reinforcement may be less available. Also, the positive effect of previous reinforcers may have diminished. The

individual may also lack the requisite skills to attain positive reinforcement or to cope with negative aspects of the environment. Chronic pain may, therefore, lead to withdrawal from previously enjoyed activities, which may be perceived as punishing if they elicit pain. Evidence has been found that individuals with chronic pain and depression report greater interference of pain in their lives and lower levels of physical activity (Banks & Kerns, 1996).

Banks & Kerns (op cit) noted a number of limitations to these models. Firstly, all of the models focus on vulnerability factors in the individual rather than the nature of the stressor itself. Also, chronic pain is symptomatic and sufferers, therefore, are reminded repeatedly of their health problem. Pain, therefore, could be seen as a chronic stressor event. Further, chronic pain conditions are the only chronic disorders where pain is the defining feature and central symptom. This leads to the sensory experience of pain being the focus of the individual sufferer's attention along with their failure to cope.

Banks & Kerns (op cit) proposed instead that co-morbidity of pain and depression could be conceptualised within a 'diathesis-stress' framework. Diathesis refers to any characteristic of a person (either biological or psychological) that increases the chance of them developing a disorder. Stress in contrast, is any environmental or life event that is perceived by the individual as threatening and beyond their capacity to cope.

Within this framework, the stressors of chronic pain are viewed as either more severe or produce losses in a greater number of areas than other medical conditions. They also may produce a greater sense of loss. Hence, external stressors are given equal prominence to vulnerability factors within the diathesis-stress model. Both vulnerability factors and factors related to pain need to be considered in the development and maintenance of depression in chronic pain conditions.

There is evidence that depression contributes to the pain experience without necessarily causing pain. Geisser, Melodye, Gaskin, Robinson & Greene (1993) assessed the relationship between depressed mood and somatic focus in individuals with chronic pain. They examined Fields' (1991) neurobiological model of pain and depression. This model has two component parts to explain the mechanism by which depression influences pain perception: 1) that depression can impact on pain transmission through a pain modulating mechanism in the brain, and 2) that mood states alter both the affective and evaluative aspects of the pain experience.

Geisser et al (op cit) found that pain threshold and pain tolerance on a cold presser test were unrelated to depression scores on the Beck Depression Inventory. In contrast, depression scores were directly related to the affective and evaluative aspects of clinical pain. The relationship between

depression and a sensory pain experience, therefore, was mediated by somatic focus.

A cognitive mechanism was proposed to explain these findings. Depressed people are more likely to interpret a bodily sensation as more threatening than it is in reality. This higher degree of somatic focus may activate pain related neurons in the brain, which in turn cause a stimulus to be perceived as more intense. This suggests that cognitive strategies aimed at altering vigilance to somatic sensations maybe useful in treating chronic pain. This may also be helpful given that increases in function via exercise and activity after a period of inactivity may also increase somatic sensation.

One problem with this study, highlighted earlier in other research, was the use of the BDI as a measure of depression in a chronic pain population. The BDI contains physical symptoms such as difficulty sleeping as symptoms of depression. This is problematic because these physical symptoms may be more symptoms related to the pain experience than to mood disturbance. Again, caution needs to be exercised when interpreting evidence of mood disturbance that is measured by the BDI.

Kuch, Cox, Evans & Watson et al (1993) examined predictor variables of anxiety and depression in patients with musculoskeletal problems in a Canadian sample. Assessment of anxiety and depression was made by

psychiatric interview and DSMIII-R criteria. Pain was measured on a Likert scale from zero to one hundred for severity. Results showed that severity of both anxiety and depression significantly correlated with self reported impact of illness and physician rated levels of disability. However, depression was a larger predictor of disability than anxiety. One limitation of this study was disability rated by physician rather than by the patient, although a standard observer rating scale was used for the disability rating.

McCracken, Faber & Janeck (1998) examined predictor variables associated with pain severity and physical complaints in a chronic pain sample referred to a US university pain clinic. The authors compared prevalence rates of pain-related anxiety with depression. They viewed depression as a general measure of distress in contrast to a pain-specific measure of distress. Results showed that both anxiety and cognitive items on the BDI for depression were significant predictors of physical complaints. However, pain-related anxiety was a stronger predictor of physical complaints than depression. Further results showed that non-specific physical complaints significantly contributed to increased disability. McCracken et al (op cit) speculated that the underlying mechanisms to explain this latter finding include the possibility that perceived physical problems may distract attention from more appropriate functional activity. In addition, perception that health is poor may be reinforced through focusing on physical problems, leading to the belief that functional activity is not possible.

McCracken, Spertus, Janeck, Sinclair & Wetzel (1999) investigated pain-related anxiety and acceptance of pain in relation to adjustment in a US chronic pain population. They initially classified patients into categories based on the Multidimensional Pain Inventory (McCracken et al, 1999). These classifications were 'dysfunctional', 'interpersonally distressed', or 'adaptive copers'. Results showed that the dysfunctional group reported greater pain-related anxiety and less acceptance of pain than the other two groups. Dysfunction was an indicator of poor adjustment to pain resulting in avoidance of activity, excess physiological arousal and catastrophic cognitive responses to pain.

In summary, there have been a number of attempts to apply psychological models to the understanding of affective distress in chronic pain. Depression appears primarily to be a consequence of chronic longstanding pain. Change in affect over the course of a chronic condition may be mediated by factors other than the sensory experience of pain. Pain-related anxiety was associated with adjustment to pain and increased physical complaints but only indirectly associated to function. Affective distress is an experience that is personal to the individual and, therefore, has a personal effect on the individual's functioning. The next section instead examines the interpersonal influence of social support on pain, disability, and distress.

1.7 Social Support and Chronic Pain

Psychological models of chronic pain emphasise the cognitive-behavioural model to explain the maintenance of pain-related behaviours. The cognitive-behavioural model assumes that environmental reinforcers maintain pain behaviours. A commonly hypothesised source of environmental reinforcer has been 'significant others' (Sharp & Nicholas, 2000).

According to Sharp & Nicholas (op cit), previous research has supported a link between significant others and measures of chronic pain and distress. Significant others have also been found to be a primary reinforcing agent of back pain in particular (Romano, Turner, Friedman, Bulcroft, Jensen, Hops & Wright, 1992). For example, more distressed partners have been found to take on a more protective role of the individual with chronic pain. This may lead to overprotective and solicitous behaviour from the partner. Over-solicitousness was associated with patient reports of greater disability and more severe pain (Romano, Turner, Jensen & Friedman et al, 1995)

Benjamin, Mawer & Lennon (1992) assessed the knowledge and beliefs of family caregivers about chronic pain patients. Thirty-four caregivers were interviewed about their perception of the patient's disorder, their preferred treatment for the patient, and their perception of their own role in treatment. Most caregivers were dissatisfied with previous investigations. They generally believed that a physical cause for patients' pain had yet to be

discovered. This was especially true if the duration of pain was fewer than two years. Approximately two-thirds of caregivers thought that distressing life events preceded the onset of pain. They failed, however, to make the connection between these life events and the onset of pain. Their preferred treatment for their relative with pain was rest, especially for women and older patients. Caregivers saw their role as one of 'protector-advocate' for the patient, and for this reason often initiated consultations with the medical profession.

An examination of the 'stress-buffering' hypothesis of social support may aid an understanding of the possible contribution of social support to the experience of chronic pain (Cohen & Ashby Wills). According to Cohen & Ashby Wills (1985), social support in general has a positive effect on well being. One model to explain this proposed that social support acts as a buffering effect when an individual is under stress. Another model proposed that social support has a beneficial effect even when an individual is not under stress, termed a 'main effect'. Cohen & Ashby Wills (op cit) stated further that a lack of positive social relationships might lead to a negative psychological state. The negative psychological state may in turn lead to a negative effect on physical health via psychological processes or increased risk following behavioural changes. The risk to physical health referred to here was not in relation to chronic conditions, but rather, physical health deterioration through poor eating habits, sleep problems, and lack of

exercise. However, the logic of the model may apply nonetheless to understanding the development of chronic pain.

Relating the stress buffering model to individuals with chronic pain, the implication is that a lack of positive social relationships and consequent negative psychological state may affect pain cognitions and pain-related behaviour. Within this model, stress arises when an individual appraises a situation as threatening or otherwise demanding and lacks an appropriate coping response. This contrasts with the main effect model, which proposes that large social networks provide positive experiences and stable, socially rewarding roles. Therefore, social support is viewed as beneficial even in the absence of stress (Cohen & Ashby Wills, 1985).

There are two psychological mechanisms hypothesised to underlie these models. Firstly, social support may intervene between an event and a reaction by preventing or attenuating the stress response. Secondly, social support may intervene between the experience of stress and the onset of a pathological outcome by reducing or eliminating the stress reaction. Within the stress-buffering model, social support is comprised of several components related to social resources. These include esteem support including emotional and expressive support, informational support, social companionship and instrumental support.

Cohen & Ashby Wills (op cit) reviewed existing evidence for both of these models. Consistent evidence was found for buffering effects of social support when certain conditions were present. Firstly, instruments that measured social support must measure the perceived availability of a support function. Secondly, instruments must also measure support functions that enhanced broadly useful coping strategies. However, there was little evidence that an individual experiencing a specific stressor would be best protected by supportive functions that are stressor specific. This suggests that supportive functions need to be directed, therefore, at coping rather than at the stressor itself.

Some evidence was also found for a main effect of social support. Support influenced well-being when support was measured in structural terms, i.e. how much support rather than quality of support. Specifically, social integration was found to influence well-being. This was particularly true when two groups were compared who had widely differing network sizes, i.e the difference between a large social network and no social network (House, Robbins & Metzner, 1982). However, social integration was not found to contribute to an improved means of coping with stressful events.

The challenge of applying the stress buffering model to the experience of chronic pain would be firstly to identify appropriate support functions. This would be followed by an examination the perceived availability of the support

functions. Finally assessment would be made of the extent to which the support functions enhance broadly useful coping strategies. This is of interest because the focus of treatment for individuals with chronic pain currently is on improving function and decreasing disability (Waddell, 1998).

Evidence was reviewed earlier that mood disorders are more likely to follow chronic pain than act as precursors (Atkinson et al 1991). It is interesting to speculate at what point social support may be most beneficial in providing a buffer against stress for people with chronic pain. This raises the question of whether social support is likely to be most useful in preventing disability, or in preventing mood disturbance following disability.

Common trends in social support have become apparent through research following on from Cohen & Ashby Wills (1985). Most commonly, a difference has been identified between emotional and instrumental support. According to Lam & Power (1991), the vulnerability factor for depression that has been most widely replicated is the absence of an intimate confiding relationship. The authors pointed out that the absence of a confiding relationship may compound the problems of a disabled group because of their need for practical help.

Lam & Power (1991) examined the relationship between quality of relationships and depression in a sample of older adults. Quality of

relationships was measured in terms of the discrepancy between perceived actual and ideal support within individuals' most significant relationships. Overall, approximately one-third each of the respondents felt they had too much overall support, adequate support, and too little support. The non-depressed group had significantly higher levels of perceived emotional support than the depressed group. The depressed group had significantly larger discrepancies both for emotional and practical support. The emotional support discrepancy score explained four-and-a-half percent of the variance on depression scores and was statistically significant. A negative correlation of perceived practical support explained a further proportion of the variance. This suggests that practical support in older adults is generally protective against depression.

Feldman, Downey & Schaffer-Neitz (1999) carried out a prospective study of individuals with a neurologically based chronic pain syndrome. They examined the interactions between pain, negative mood, and perceived social support using a daily diary method of data collection. Results showed that pain increased depression, anxiety and anger. However, the converse was not true. Only depression increased reports of pain. Perceived social support contributed to reductions in both negative mood and pain. Supportive interchanges with spouses reported by participants involved encouraging active coping, and discouraged thoughts and actions linked to feelings of helplessness and catastrophic decline in functioning. Feldman et

al (op cit) did not address the impact of social support on physical functioning directly. However, the evidence that patients were able to identify supportive interchanges that encouraged active coping suggests that support does not necessarily discourage independence.

Patrick & D'Eon (1996) investigated the relationship among pain, social support and physical performance on an exercise task in a chronic pain patient sample in Canada. Each patient was filmed along with their spouse as they exercised on a stationery bicycle. Emotional support and task related support were rated from video footage. Results showed that the physical performance of patients was significantly related to emotional support and not task related support. Physical performance was also negatively associated with pain intensity. Interestingly, patients did not perceive task related support as supportive. One limitation of the study was the physical performance aspect of the study. Patrick & D'Eon (op cit) viewed the exercise task as providing an objective measure of physical performance. However, this performance would not necessarily translate to appropriate physical functioning in a natural setting.

Paulsen & Altmeier (1995) examined the effects of perceived versus enacted social support on pain-related behaviour in a US sample of chronic patients. Pain-related behaviour displayed by patients was recorded when alone, and when with their spouse. Pain-related behaviour included 'guarding', for

example, abnormally stiff movement, 'bracing', for example, maintaining an abnormal distribution of weight, 'grimacing', 'verbal complaints', and 'sighing'.

Results showed that participants differed on displays of pain-related behaviour depending on both the presence of their spouse and reports of support from their spouse. Specifically, patients who reported greater enacted support from their spouse had significantly greater pain behaviours regardless of whether or not the spouse was present. However, patients who reported greater perceived spouse support displayed greater pain behaviours only when their spouse was absent. Rather than enacted support being a discriminative cue for pain-related behaviour, the evidence from Paulsen & Altmeier (op cit) suggests that solicitousness by spouses is associated with overall increases in pain-related behaviour.

In summary, the extent to which quality of relationships contributes to levels of functioning and subsequent mood disorders is complex. Emotional support appears to lessen pain and increase coping. However, there also appears to be a fine line between positive social support and oversolicitousness. Oversolicitousness is associated with increased perceived pain and increased pain-related behaviour. Task related support on a physical performance task was not perceived as supportive. If this is applied to a chronic pain patient population, this latter finding is potentially

problematic. Appropriate withholding of practical support which involves encouragement to manage tasks by oneself, may increase functioning. However, if it is not perceived as helpful, it may damage the quality of emotional support, leading to psychological distress, and increased disability. Social support reflects interpersonal experiences in the management of pain and disability. In contrast, environmental factors may also influence the pain experience of the individual. The corollary of this is that the individual's pain experience may influence how they interact with their environment. One measure of this is the individual's relationship to the employment environment. The next section, therefore, examines the relationship among employment status and chronic pain, distress and disability.

1.8 Employment Status and Chronic Pain

Unemployment is a significant problem for people with chronic pain. Rucker & Metzner (1995) examined predictor variables of employment status of individuals who had received a decision on an application for permanent disability benefits in the US. Pain-related variables contributed significantly to individuals' employment status following a social security benefits decision. Examples of pain-related variables were frequency of pain and degree that the individual talked about pain, length of pain free periods, and unpleasantness during periods of highest pain intensity.

Psychological variables were also significant. Specifically, individuals who expressed feelings of hopelessness, symptoms of depression and beliefs that they would never work again, were less likely to be working at six month follow-up. Psychological predictors of employment status, however, were unrelated to reports of pain intensity. Further, individuals' assessment of their own functional limitations due to pain had little impact on whether or not they were employed at six month follow-up.

There were two main limitations to this study. Firstly, all individuals in the study had applied for disability benefits, hence this factor was not controlled for in the study. There was also no control for the effect of interventions. Individuals in the study had received a variety of medical and psychological interventions.

Jackson, Iezzi and Lafreniere (1996) evaluated the differential effects of employment status for people with chronic pain in comparison to a healthy control group in a Canadian sample. They found generally that individuals with chronic pain who were unemployed were more poorly adjusted psychologically than individuals with chronic pain who were in employment. The unemployed chronic pain group were also more poorly adjusted than healthy individuals both employed and unemployed. The unemployed chronic pain group reported more financial strain, less structured and purposeful activity, fewer opportunities for skill use and task variety, and

decreased social support, when compared with all other groups. Individuals in the unemployed chronic pain group also had a higher frequency of health care use, viewed their days as longer and had more previous jobs than individuals with chronic pain in employment. However, there was no difference between any of the groups on work ethic values.

The authors rightly point out that the extent to which unemployment was a cause or consequence of poorer functioning cannot be determined from these results. They speculated, however, that poorer physical functioning and emotional adjustment might be risk factors for unemployment, while unemployment may be a cause in itself of further distress.

Jackson, Iezzi, Lafreniere & Narduzzi (1998) evaluated the extent to which the relationship between employment status and emotional distress may be mediated by pain-related and psychosocial measures. From longitudinal studies, they found that return to work was accompanied by improvements in physical functioning, reductions in pain intensity and decreases in emotional distress in people with chronic pain. In the general population, perceived financial strain was more strongly associated with psychological distress than actual reductions in income level. Further, reduction in structured and purposeful time was associated with increased emotional distress in unemployed persons in the absence of a chronic medical condition.

Jackson et al (op cit) found overall that pain severity had direct associations with both emotional distress and employment status. However, employment status was only indirectly related to emotional distress. The relation between these two variables was instead mediated by level of financial strain and the level of structured and purposeful use of time. The latter finding suggests that it is not unemployment per se that is problematic if the individual has some other way of employing their time in a useful and structured manner.

One limitation of the study above is the inclusion only of involuntarily unemployed persons. Results, therefore, may not generalise to voluntarily unemployed persons who are not seeking paid employment. The authors highlighted that emotional distress and the experience of being unemployed correspond in part to heightened pain severity. In contrast, lower ratings of pain severity corresponded with being employed and reporting less emotional distress. It is possible that individuals who are voluntarily unemployed are able to find sufficient substitutes for employment in terms of structured and purposeful use of time. Hence, they may also report less emotional distress. Voluntary unemployment implies some sort of advanced planning, and this too may contribute to more helpful purposeful activity that may be beneficial in terms of pain management.

A review of research into factors that predict employment status outcome after a rehabilitative programme may contribute to an understanding of causality amongst some of the variables identified above. A number of studies have examined predictor variables of return to work in patients with chronic back pain. This is of particular importance for rehabilitative efforts in order to accurately target factors that are amenable to treatment effects. It may also be helpful in matching individuals to appropriate treatment programmes.

Gallagher, Rauch, Haugh & Milhous et al (1989) examined determinants of return to work in a sample of 177 US low back pain patients, half of whom were seeking social security compensation. They found that age and length of time out of work were significant predictors of non-return to work after a rehabilitation programme. When age and length of time out of work were controlled, physical examination and biomechanical measures were not predictive of return to work. The authors speculated on several explanations for this finding. One was that absence from employment weakens work identity. Coping strategies that are associated with non-working were also suggested to possibly contribute to chronicity over time. Further, the individual's perception of ease of changing occupations may also important, as may also be the impact of local and environmental conditions on job opportunities.

Dozois, Dobson, Wong, Hughes & Long (1995) examined psychological factors associated with rehabilitation outcome in low back pain patients. A total of 117 male workers in a work based rehabilitation programme were assessed at entry to the programme and at nine month follow-up. From complete data on seventy-seven subjects, Dozois et al (op cit) found that depression and psychological distress were important pre-treatment variables in predicting employment outcome. During the course of treatment, the total sample generally improved in perceived disability, self-reported depression, general distress, functional status and coping strategies. These gains were achieved despite no significant change in pain ratings. More specifically however, functional status and perceived disability were variables that differentiated patients who did and did not return to work.

Burton, Polatin & Gatchel (1997) examined the impact of psychosocial risk factors on long term outcome for people with work-related chronic pain, in a US sample. Failure to return to work following attendance at a functional restoration programme was predicted by a number of psychosocial variables. These included past diagnosis of substance abuse, past or current anxiety disorder, history of child abuse, self-reported depressed mood, moderate to high perceived level of disability, age and prior surgical treatment. Individuals who returned to work experienced significantly greater improvement in depressed mood, and perceived disability as less of a burden from pre- to post-programme. Therefore, while a variety of

psychosocial risk factors were identified as predictors of failure to return to work, nonetheless, treatment variables of mood enhancement and improved perception of disability were shown to counteract the risk factors in some individuals.

Van der Giezen, Bouter & Nijhuis (2000) examined predictors of return to work in low back pain patients. They examined information on health status, history of low back pain, occupational variables, job characteristics, and socio-economic variables. In their Netherlands sample, return to work was predicted by general health status, job satisfaction, 'bread winner' status in the home, lower age and report of less pain. Van der Giezen et al's (op cit) analysis focused on individuals at work 12 months after a period of three to four months sick listed. A total of 77 percent of individuals returned to work. The authors noted that this rate was higher than some studies because they counted various degrees of return to work, for example, part-time work. They also excluded relapses during the twelve month period if the individual was working at the time of the follow-up. Overall, their results suggested that being out of work one year after an initial episode of sick leave is more related to psychosocial and economic factors than physical factors such as capacity to carry out activities of daily living.

In summary, unemployment results in poorer psychological adjustment to pain, alongside problematic social outcomes. These include increased

financial strain, less structured and purposeful activity, and decreased social support. Unemployment may be less problematic for individuals for whom this is a planned state who have an alternative means of taking part in structured and purposeful activity. Changes in employment status resulted in improved mood and improved perceived levels of disability. Disability social security benefits are also linked to unemployment in chronic pain populations. An examination of the influence of disability benefits on the experience of chronic pain, therefore, follows below.

1.9 Disability Benefits and Chronic Pain

In the review on employment status and chronic pain, social security compensation and disability benefits featured as economic considerations of disability-related unemployment. It may be informative, therefore, to consider the relationship among disability benefits and disability compensation, and chronic pain, distress and level of disability.

Guest & Drummond (1992) examined the effects of compensation following a work-related injury on emotional state and reported pain intensity for patients with chronic back pain in an Australian sample. Guest & Drummond (1992) compared patients who received ongoing compensation payments with patients who had settled a claim for compensation with their employer. Ongoing compensation recipients showed greater emotional distress, had greater difficulty coping with pain and reported that pain disrupted their life to

a greater degree than patients who had settled their claim. Those who had settled were older than ongoing recipients and had a longer history of pain.

In Australia, settlement of compensation claims were apparently negotiated more quickly for older people. This was because older people were less likely to return to work, according to the authors. Settlement for younger people is also less of an option if the individual is likely to remain unemployed, as final compensation is usually limited to three years of the average salary. Hence, it may be more beneficial for the disability compensation process to be prolonged for younger people in order to maintain financial security. Guest & Drummond (op cit) suggested, therefore, that an individual with chronic pain who is faced with unemployment might strive to maintain their disabled status. In support of this, Guest & Drummond (op cit) also found that reports of pain intensity did not differ between ongoing compensation recipients and those who had settled their claim. The ongoing recipients, however, were less tolerant of pain in an emotional context.

Højsted, Alban, Hagild & Erikson (1999) investigated how economic compensation for disability in patients in Denmark with chronic pain affected utilisation of health services in terms of total costs of hospital care. Four subgroups of individuals were studied. Two groups were applicants for disability benefit who had either received a lump sum award or were rejected

for an award of benefit. The other two groups were applicants who had received a decision about an award for benefit, and who either accepted that decision or appealed against it. Health service utilisation was examined in the year preceding the claim, during the period from submission of the claim to the decision being made, and during the year following the decision.

Results showed overall that patients with chronic pain had significantly lower health service utilisation after receiving a disability pension than before a pension was awarded. Patients who did not receive a pension or who were dissatisfied with the level of pension maintained their level of health service utilisation. The mean usage of health services was three times greater in patients who appealed a decision than in those who accepted the level of pension awarded.

Other specific results found over the three time periods were firstly that use of the health care system in the sample was most intensive during the year preceding the application. This decreased by 50 percent during the period of waiting for a decision. If a pension was awarded and found acceptable, health service utilisation decreased by an average of a further 50 percent. However, if an appeal was made, there was no further decrease in health service utilisation upon receipt of pension award.

The authors speculated that receiving a disability pension is more socially acceptable than other kinds of social assistance. This possibility, accompanied by a perceived insufficient level of economic income, may have contributed to ongoing pain behaviour, and hence increased health service utilisation.

In summary, processes associated with disability related income and single payment compensation for disability were related to pain processes. These processes included increased healthcare useage, increased level of distress and decreased ability to cope with pain.

1.10 Aims

The overall aim of this study is to determine whether or not people with chronic pain have poorer quality of life when compared with another group of people with a chronic condition. The control group for this study is an insulin treated diabetes population. The rationale for this choice of control population follows in section 1.11 below. In order to attempt to understand why there may be such a difference between groups, the study will also attempt to determine whether or not there are differences between the groups on level of physical functioning.

The secondary aim of the study is to examine variables that are associated with physical functioning. In so doing, it may be possible to make

suggestions about future treatment directions which currently focus on improving functioning in people with chronic pain.

1.11 Quality of Life and Associated Factors in Insulin Treated Diabetes

Individuals with insulin treated diabetes were selected as a control group firstly because the condition is lifelong following the point of diagnosis (Jacobsen, 1996). Jacobsen (op cit) also noted that a diagnosis of diabetes requires significant lifestyle changes in self care as well as adherence to medical treatment. Adherence to both medical treatment and lifestyle changes reduces the risk of long term medical complications. Complications include circulatory problems, especially of the feet and legs which can lead to amputations, liver and kidney function problems, and eye problems. All of these factors have possible psychological sequelae.

In summary, people with diabetes have a chronic condition which requires ongoing modifications to lifestyle and self care. In this respect they are a similar group to people with chronic pain. There are clear threats of long term complications to poorly controlled diabetes whereas in chronic pain there are a combination of real or perceived threats to long term health, depending on the aetiology of the pain. Both diabetes and chronic pain have psychological sequelae for at least some individuals within each patient group. Finally, despite the chronic nature of both conditions, health-

related quality of life with diabetes and chronic pain appear to differ markedly.

1.12 Summary

The study of quality of life for individuals with chronic pain is complex. A broad perspective of quality of life takes into account health-related variables in addition to personal variables such as psychosocial adaptation to the health condition, and impact of the environment and social relationships on the experience of that condition. Research of individuals with chronic pain has shown differences in quality of life, for example, measured by level of distress, disability, employment factors and quality and content of relationships. Each of these broad areas encompass negative outcomes following prolonged exposure to pain for many individuals. However, factors within these broad areas were also shown to be contributory factors in the maintenance and worsening of the pain experience. Much of the research which investigated the myriad of combinations of such factors that contribute to an understanding of quality of life investigated groups of individuals with chronic pain. It is necessary to note, however, that the pain experience is best understood as a uniquely personal and individual experience. In this way, research outcomes may be most effectively applied to clinical practice.

1.13 Hypotheses

In the between groups analysis in the present study, there were three central hypotheses as follows:

1 individuals with chronic pain will score significantly lower on overall quality of life when compared with individuals with chronic diabetes,

2 individuals with chronic pain will score significantly lower on levels of physical functioning when compared with individuals with chronic diabetes, and

3 the variable overall quality of life will significantly correlate with the variable physical functioning.

There were four further hypotheses in a within-groups analysis. These were related to an examination of predictor variables of physical functioning for individuals with chronic pain. There were three variables hypothesised to predict physical functioning, and one further variable not hypothesised to predict physical functioning. These were as follows:

4 depression will predict physical functioning,

5 employment status will predict physical functioning,

6 practical support will predict physical functioning, and

7 pain severity will not predict physical functioning.

2 Method

2.1 Design

This study firstly employed a between subjects design. The aim was to test the first two hypotheses that individuals with chronic pain would report poorer quality of life and that they would also report reduced function when compared with individuals with another chronic condition. Additionally, it was hypothesised that reduced function would correlate with overall quality of life.

This study secondly employed a within subjects design. The aim was to test the subsidiary hypotheses that level of functioning for people with chronic pain was predicted by depression, employment status and practical support but not by the sensory aspect of pain.

2.2 Participants

Participants in the experimental group were fifty consecutive patients attending their first appointment at a Pain Clinic in Forth Valley. Control participants were forty-five consecutive patients with insulin treated diabetes attending an appointment at a Diabetes Clinic in Forth Valley. The mean age of the experimental group was 50.44 years (S.D.15.6) compared with the control group at 47.56 years (S.D. 12.6). There were 46 percent males and

54 percent females in the experiemental group and 44 percent males and 56 percent females in the control group.

Inclusion criteria for the experimental population were as follows:

1 pain experienced for a period of six months or more,

2 attendance at a first appointment at a pain clinic, and

3 a minimum of 18 years of age.

The six month criteria for chronicity was determined based on current practice although recent research now employs a three month period for chronicity (Waddell, 1998). The criteria that participants must be attending their first appointment at the clinic was determined in order to limit the influence of potential positive effects of treatment.

Exclusion criteria for the experimental population were as follows:

1 current treatment for major mental health problems,

2 individuals with a learning disability,

3 individuals involved in a psychological study in the past year, and

4 individuals with diabetes mellitus.

Individuals with major mental health problems were excluded for several reasons. Firstly, they may have been receiving treatment that is beneficial to pain management. For example, treatment might include addressing problems of low mood with education, activity scheduling, and increased positive activities. Also, having a diagnosis of a major mental health problem may predispose a poorer quality of life in addition to that occurring with chronic pain alone. One individual was excluded on this basis.

People with a learning disability were excluded because their quality of life again will be likely to be determined in part by their disability. There were no exclusions from the study on this basis.

People who had been involved in a psychological study in the past year were excluded in order to prevent over testing. There were no exclusions on this basis.

Finally, people with diabetes, whether treated with diet management alone, tablets or insulin, were excluded from the study. This was in order to maintain the heterogeneity of the experimental and control groups for comparisons between them to be possible.

Inclusion criteria for the control population were as follows:

1 a diagnosis of diabetes mellitus which is treated with insulin,

2 diabetes mellitus for six months or longer in duration, and

2 a minimum of 18 years of age.

Exclusion criteria for the control population were as follows:

1 treatment for major mental health problems,

2 individuals with a learning disability,

3 individuals involved in a psychological study in the past year, and

4 individuals with chronic pain.

There were no exclusions from the control population on the basis of the above criteria.

2.3 Procedure

Participants were recruited at their first attendance at pain clinics in Forth Valley Health Board.

Prospective participants were sent an information sheet about the study with their appointment. In addition, all participants were given a copy of the information sheet about the study at their clinic attendance. If individuals were happy to take part, a list of inclusion and exclusion criteria was completed along with a consent form to participate.

Each participant was given a questionnaire pack to complete during their attendance at the pain clinic or diabetes clinic. If they were unable to complete the questionnaire within the time frame of their attendance, they were given a self-addressed and stamped envelope in order to facilitate the return of the pack in the post.

As part of the ethical requirements for the study, scores on the Hospital Anxiey and Depression were calculated prior to the participant leaving the clinic. All scores on this measure were discussed with participants at this stage. Participants were offered the opportunity for an appointment with a Clinical Psychologist if they scored within the severe range for either anxiety or depression. If they declined an appointment, they were offered the opportunity to contact the department within the time frame of the study should they reconsider their decision. All participants were given the information sheet to take away with them and were offered the opportunity to receive a copy of the overall results at the end of the study.

2.4 Measures

There were a number of measures investigated in this study. The demographic information gathered included the standard variables on age, sex and marital status. In addition, personal history data included number of children under the age of five, total number of children, educational

background and postcode. Work related variables included previous work history, current employment status and importance of employment. Health related variables included the diagnosis and duration of the condition, as well as current medication. All of the questionnaires that have been employed in this study appear in the Appendix.

The following measures were used in this study:

Hospital Anxiety and Depression Scale (HADS),

World Health Organization Quality of Life Scale (short form)

(WHOQOL-BREF),

Short Form 36 Health Survey (SF36),

short form McGill Pain Questionnaire (short form MPQ), and

Significant Others Scale (B) (SOS-B).

A summary of the standardised measures used in the study follows below.

2.4.1 Hospital Anxiety and Depression Scale

The HADS was developed as a self-assessment scale of mood for hospital medical outpatient clinics. The content was devised in response to two common objections about questionnaires on mood disorders. These were firstly, that scores are affected by the physical symptoms of medical conditions that may be due to either aspects of the illness or to mood disturbance. There was also insufficient distinction between one mood

disturbance and another. Items on the HADS were selected, therefore, solely on the basis of psychic symptoms. The HADS was found to be a reliable instrument for screening for clinically significant anxiety and depression (Zigmond & Snaith, 1983). It was also found by Zigmond & Snaith (op cit) to be a valid measure of severity of mood disorders.

The HADS is useful, according to Zigmond & Snaith (op cit), when asking questions of 'how much' mood disturbance is present rather than 'is it there', i.e. its presence or absence. They stated that mild psychiatric disorder could not be assessed simply on the basis of present or absent because the degree of distress in a population is continuously distributed.

2.4.3 World Health Organisation Quality of Life Scale

The WHOQOL in its long form was designed to measure quality of life in relation to health and healthcare in its broadest sense rather than related only to morbidity and mortality rates (Szabo, 1996).

The short form of the WHOQOL has four domains rather than six as in the long form, as follows: physical health, psychological health, social relationships and the environment. The four domains contain items from all 24 facets on the long form. The domain scores procduced by the WHOQOL-BREF correlated highly (0.89) with WHOQOL-100 scores (WHOQOL Group, 1998b). The WHOQOL-BREF is noted to be longer than some quality of life

questionnaires. However, there are more domains in the measure, for example the social relationships and environment domains, that are not always included in other measures.

2.4.4 Short Form 36 Health Survey

The SF-36 is a multipurpose survey of general health status which yields two overall summary measures of physical health and psychological health. Within these two overall measures, there are eight scales. These are, physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional and mental health (Ware, 1998).

The SF-36 is recommended as a useful generic questionnaire of health-related quality of life rather than as a principle measure of health outcome. It is useful, therefore, for making comparisons across studies and between health populations (Ware op cit). The SF-36 has been tested for content, criterion and construct validity and has been found to be acceptable on all these measures (Jenkinson, Layte, Wright & Coulter, 1996). The particular strengths of the SF-36 are that it takes approximately ten minutes to complete and was found to be sensitive in particular to lower levels of disability (Jenkinson et al op cit).

2.4.5 Short form McGill Pain Questionnaire

The main component of the short form MPQ consists of fifteen descriptor words. Eleven of these are sensory descriptors and four are affective descriptors. The intensity of each descriptor is rated by the participant on a scale of zero to three where zero is 'none' and three is 'severe'. It also has a visual analogue scale and a present pain index score. For the purposes of this research, the sensory component of the measure is the area of interest. The short form MPQ provides a rapid form of measuring subjective pain experience (Melzack, 1987). The short form MPQ correlates highly with the main pain rating index of the long form. In addition, the long form has undergone extensive valdity and reliability testing (Melzack & Katz, 1992).

2.4.6 Significant Others Scale (scale B)

The Significant Others Scale was designed to examine the quality of an individual's most significant relationships. Form A of the scale specifies seven individuals who are likely 'significant others'. Form B of the scale allows the respondent to select the key individuals to be rated. Each of four support functions is rated by the respondent in terms of received and ideal levels of support. Total raw scores on the emotional and practical components are divided by the number of 'significant others'. This gives an emotional, practical, and disrepancy score for practical support. The less the discrepancy there is between the actual and ideal levels of support, the better the quality of significant relationships.

Results from factor analysis showed that the division between practical and emotional support was useful (Power, Champion & Aris, 1988). Further, longitudinal analysis showed good test-retest reliability. Power et al (op cit) also found that the scale significantly distinguished between depressed and non-depressed participants.

2.5 Ethical Approval

The Ethical Committee of Forth Valley Health Board granted ethical approval in December 2000.

2.6 Power Calculation

A power calculation was obtained from statistical tables of effect sizes. Four variables in a multiple regression analysis with a large effect size requires fifty subjects.

3 Results

3.1 Demographic Characteristics

A total of 50 participants were recruited to the experimental group and 45 participants to the control group in the present study. One potential participant was excluded because of a major mental health problem. A further potential participant declined to take part in the study. A summary of demographic characteristics of the experimental and control group is presented in Table 3.1 at the end of section 3.1.

3.1.1 Age, Gender, Marital Status, and Children

The mean age of the experimental group was 50 years ranging from 20 to 79 years of age. The mean age of participants in the control group was 48 years ranging from 29-85 years of age.

The experimental group was comprised of 46 percent (n=23) males and 54 percent (n=27) females. The control group was comprised of 44 percent males (n=20) and 56 percent (n=25) females.

Seventy-six percent (n=38) of the experimental group were married or living as married and 16 percent (n=8) were single. Two further participants were widowed, one was separated and one was divorced. Seventy-eight percent (n=35) of participants in the control group were married or living as married.

A further nine percent (n=4) were single, two participants were widowed, two were separated and one was divorced.

Eighty-four percent (n=42) of participants in the experimental group had children. In the experimental group, eight percent (n=4) of the sample had one pre-five child each. In the control group, 78 percent (n=35) of participants had children. One participant had one pre-five child.

There were no significant differences between the experimental and control groups on age, gender, marital status or number of children, as presented in Table 3.1.

3.1.2 Education

The mean number of years of secondary education in the experimental group was 4.3 years (S.D. 1.16) ranging from one to six years. In comparison, the mean number of years of secondary education for participants in the control group was 4.2 years (S.D. 1.05), ranging from two to six years.

Sixty-two percent (n=31) of participants in the experimental group and 76 percent (n= 34) had no further education. A further 22 percent (n=11) in the experimental group, and 20 percent (n=9) in the control group had between two and four years of further education.

Forty-two percent (n=21) of participants in the experimental group and 40 percent (n=18) of participants in the control group stated they had no qualifications. A further 20 percent (n=10) of participants in the experimental group and 31 percent (n=14) in the control group had secondary school and vocational qualifications. Eighteen percent (n=9) of participants in the experimental group and 13 percent (n=6) in the control group had professional qualifications such as City & Guilds for engineering and nursing training. Finally, 20 percent (n=10) of participants in the experimental group and 16 percent (n=7) of participants in the control group had a degree or post-graduate degree level qualification.

There were no signficant differences between the experimental and control groups on any of the factors associated with educational background, again as presented in Table 3.1.

3.1.3 Employment

Thirty-six percent (n=18) of participants in the experimental group were employed compared with 51 percent (n=23) of participants in the control group. In the experimental group, 14 percent (n=7) were unemployed compared with two participants in the control group. A further 18 percent (n=9) of participants in the experimental group were retired compared with 31 percent (n=14) in the control group. Finally, 24 percent (n=12) of

participants in the experimental group were ill-health retired compared with one participant in the control group.

In the 'other' category, two participants in the experimental group and one in the control group stated they were 'ill-health unemployed'. In addition, one participant in the experimental group stated 'incapacitated', and one stated 'housewife'. All of these 'other' responses were recoded as 'unemployed'. The retired and ill-health retired groups were also recoded into one retired subgroup.

Figure 3.1 below illustrates the marked difference between the experimental and control groups with respect to employment and unemployment. Results of a chi square analysis between the experimental and control groups on employment and unemployment revealed a significant difference between the groups (χ^2=5.03, df=1, p<0.03).

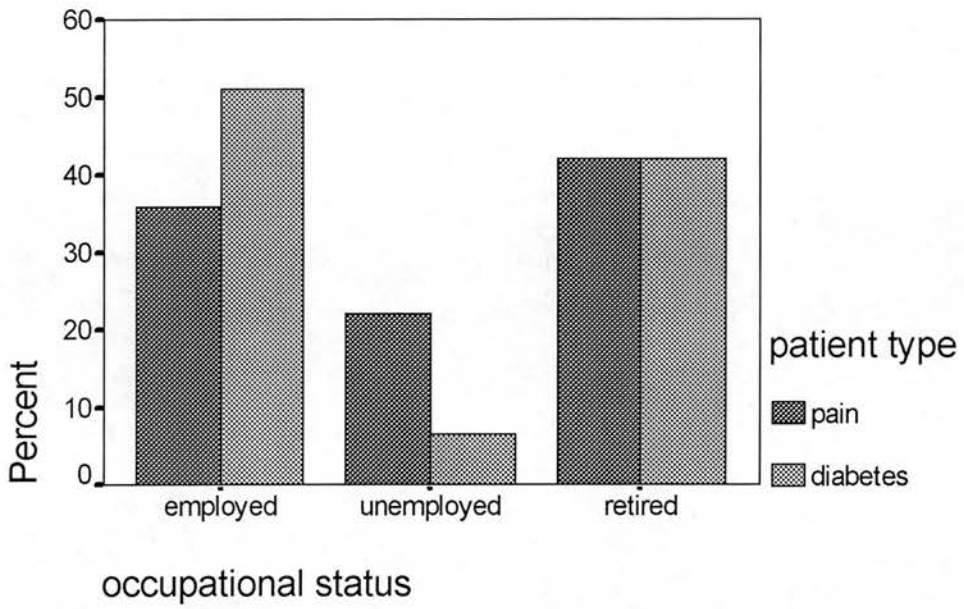

Figure 3.1: Percentage of experimental and control group participants in three employment categories

The mean number of hours worked by participants in the experimental group was 40 hours per week (S.D. 9.56), ranging from 20 hours to 60 hours. In comparison, the mean number of hours worked by the control group was 36 hours per week (S.D. 8.57), ranging from 18 to 48 hours per week. There was no significant difference between the groups in number of hours worked.

Participants were asked how important it was for them to have paid employment on a scale of one to ten. The mean rating of importance of employment was 9.06 (S.D. 1.73) for employed participants in the experimental group and 9.09 (S.D. 2.04) in the control group. The mean rating was 4.18 (S.D. 3.31) for unemployed participants in the experimental

group and 7.67 (S.D. 2.52) in the control group. Finally, the mean rating of the importance of employment for retired participants in the experimental group was 4.43 and 3 for the control group.

There were no significant differences in the importance of employment between the experimental and control groups within each occupational category. However, results from a T-test revealed that overall there was a significant difference between the working and non-working participants in terms of their rating of the importance of employment ($t=1.6$, $df=39$, $p<0.001$, 2 tailed). As might be expected, participants in employment rated the importance of employment significantly higher than did participants not in employment. Table 3.1 presents clearly some indication of the magnitude in difference between the groups on this variable.

3.1.4 Deprivation Category

The deprivation category was ascertained from postal codes of participants. These were assigned to a category from 1 to 6 based on social deprivation of all individuals of all ages within Forth Valley Health Board who were registered with a General Practitioner in March 2000. The deprivation categories were devised based on the 1991 census.

Thirty percent (n=15) of participants in the experimental group were in the three highest deprivation categories compared with 42 percent (n=19) in the

control group. The converse of this was that 68 percent (n=34) of participants in the experimental group were in the three lowest deprivation categories compared with 53 percent (n=24) in the control group. There was one missing value in the experimental group and two missing values in the control groups as these postal codes had no category assigned to them. There were no significant differences between the groups on deprivation category.

3.1.5 Alcohol Consumption

Seventy-eight percent (n=39) of participants in the experimental group said they drink alcohol compared with 58 percent (n=26) of participants in the control group. The mean number of units drank per week by participants in the experimental group was 5.68 (S.D. 9.87), ranging from one unit to sixty. In comparison, the mean number of units drank per week by participants in the control group was 10 (S.D. 15.47), ranging from one unit to eighty units. Removing one outlier from each group resulted in the mean alcohol intake for the experimental group changing to 4.22 and for the control group 7.2. A t-test analysis revealed that intake of alcohol was signficantly higher for individuals with chronic diabetes than individuals with chronic pain ($t=.82$, df 60, $p<0.05$, 2 tailed).

3.1.6 Medication Use

The mean number of total medicines used on a daily basis was 2.48 (S.D. 2.29)for participants in the experimental group, ranging from 0-9 medicines, and in the control group 3.91 (S.D. 3.27) medicines, ranging from 1-13 medicines per day. Sixteen percent (n=8) of participants in the experimental condition took no medication. In comparison, there were no participants in the control group who took no mediccation, as expected because all were insulin users. Within the control group, 22 percent (n=10) took one medicine per day.

Of the participants in the experimental group on medication, 50 percent (n=21) were one taking non-opiod anlgesic medication per day. Twenty-nine percent (n=12) of participants took one opiod analgesic per day, 38 percent (n=16) of participants took one non-steroidal anti-inflammatory medicine per day, and 29 percent (n=12) took one antidepressant medicine per day. It should be noted that the antidepressant medicine 'Amitryptaline' is used as a pain alleviating medicine with an antidepressant effect. Of the participants on anti-depressant medicine, only one was prescribed a medicine other than Amitryptaline. In this one case the inidividual was prescribed Prozac for its antidepressant effect only.

3.1.7 Duration of Condition

The mean duration of experience of the chronic condition for individuals with chronic pain was 7 years (SD 14.34) compared with 15.7 years (SD 10.7) for individuals with chronic diabetes.

Table 3.1: Demographic Characteristics of the Experimental Group

	Experimental Group		Control Group	
Age	Mean	(SD)	Mean	(SD)
age	50.44	(15.80)	47.55	(12.59)
Gender	N	%	N	%
male	23	46	20	44
female	27	54	25	56
Marital Status	N	%	N	%
married/living as married	38	76	35	78
single	8	16	4	9
widowed	2	4	2	4
separated/divorced	2	4	4	9
Education	Mean	(SD)	Mean	(SD)
years of secondary education	4.26	(1.16)	4.24	(1.05)
years of further education	1.80	(2.67)	1.16	(2.63)
Qualifications	N	%	N	%
no qualifications	21	42	18	40
secondary and vocational	10	20	14	31
degree and post graduate	10	20	7	16
other professional	9	18	6	13
Employment status	N	%	N	%
retired	21	42	19	42
employed	18	36	23	51
unemployed	11	22	3	7
Hours worked	Mean	(SD)	Mean	(SD)
hours worked per week	39.81	9.56	35.65	(8.57)
Rating of importance of paid employment	Mean	(SD)	Mean	(SD)
employed subgroup	9.06	(1.73)	9.09	(2.04)
ill-health retired subgroup	6.25	(3.91)	5.00	(4.06)
unemployed subgroup	4.18	(3.31)	7.67	(2.52)
retired subgroup	2.00	(2.65)	3.00	(3.60)
total group	6.04	(3.87)	6.42	(4.07)
Deprivation categories	N	%	N	%
2-3 (greater deprivation)	15	30	19	42
5-6 (lower deprivation)	11	22	9	20
Alcohol consumption	N	%	N	%
yes	39	78	26	58
no	11	22	19	42
Units of alcohol per week	Mean	(SD)	Mean	(SD)
units	5.68	(9.84)	10	(15.47)
Number of Medicines	Mean	(SD)	Mean	(SD)
total medicines	2.48	(2.29)	3.91	(3.27)
Number of Years with medical condition	Mean	(SD)	Mean	(SD)
years	7.01	(14.34)	15.7	(10.7)

3.2 Quality of Life

The task was to establish whether or not individuals with chronic pain differed significantly in their rating of overall quality of life on the WHOQOL-BREF, from individuals with chronic diabetes. Results showed that participants in the experimental group scored significantly lower on the overall quality of life than participants in the control group ($t=2.75$, df 93, $p<0.01$, 2 tailed).

The next task was to establish if participants in the experimental group scored significantly lower on general health on the WHOQOL-BREF than participants in the control group. Results showed that participants in the experimental group rated their general health signficantly lower than participants in the control group ($t=4.50$, df 93, $p<0.001$, 2 tailed).

These results above indicate that individuals with chronic pain have significantly reduced overall quality of life and rated their health significantly poorer than individuals with chronic diabetes. The significance of the differences in perception of general health was greater than for overall quality of life.

Step-wise multiple regression analyses were carried out to determine which of the domains within the WHOQOL-BREF were most predictive of overall quality of life and of general health. Table 3.2 below presents a summary of the results from the multiple regression analyses.

Results showed firstly that the physical health domain was the only significant predictor of overall quality of life for individuals with chronic pain [R^2=.41,F(1,48)=33.91,p<0.001] and for individuals with chronic diabetes [R^2=.41,F(1,43)=30.08,p<0.001] The physical health domain, therefore, accounted for 41 percent of the variance on the overall quality of life score for both individuals with chronic pain and chronic diabetes. Both individuals with chronic pain and chronic diabetes, therefore, perceived their physical health as the most important factor in their perception of their overall quality of life.

Further results showed that the physical health domain was the largest predictor of general health for individuals with chronic pain [R^2=.25,F(1,48)=15.75,p<0.001] and was further significantly predicted by the environment domain [R^2=.35,F(1,48)=11.46,p<0.001]. In comparison, only the physical health domain was a significant predictor of general health for individuals with chronic diabetes [R^2=.38,F(1,43)=26.11,p<0.001].

Health-related quality of life, therefore, differed between individuals with chronic pain and individuals with chronic diabetes. Physical health accounted for only 25 percent of the variance in general health in individuals with chronic pain compared with 38 percent for individuals with chronic diabetes. A further 8 percent of the variance in general health was explained by the impact of the environment for individuals with chronic pain, but not for individuals with chronic diabetes.

Table 3.2: Summary of Step-Wise Multiple Regression Analyses Predicting Overall Quality of Life from Quality of Life Domain Scores

Group	Criterion	Predictor	Beta	t	F	R^2
experimental	overall qol	physical health	.64	5.82	33.91**	.41
control	overall qol	physical health	.64	5.82	30.08**	.41
experimental	general health	physical health	.50	3.97	15.75**	.25
experimental	general health	environment	.32	2.37	11.46**	.32
control	general health	physical health	.61	5.11	26.11**	.38

**p<0.001

3.3 Assessment of Function

Physical functioning was assessed using the Short Form 36 Health Survey (SF-36). As stated earlier, the SF-36 is a health-related quality of life scale. It has one question on perception of overall health and one question comparing present state of health to one year ago. In addition, it has eight domains which measure a variety of aspects of health. For the purposes of this study, only the physical functioning domain was used in the analysis of data. This was in order to prevent duplication of quality of life data gained

from the WHOQOL-BREF. The physical functioning domain was selected on the basis of previous research which showed that the physical functioning domain is sensitive to small differences in disability.

The mean score on the physical functioning domain for individuals with chronic pain was 37 (S.D. 27.33), and 56.89 (S.D. 40.23) for individuals with chronic diabetes.

A t-test was carried out on the physical functioning measure to determine if there was a significant difference between the groups on physical functioning scores. Results showed that individuals with chronic pain scored significantly lower in physical functioning than participants with chronic diabetes ($t=3.29$, df 80.66, $p<0.001$).

Physical functioning differed significantly, therefore, between individuals with chronic pain and chronic diabetes. Quality of life for individuals with chronic pain was related more to physical functioning, therefore, than for individuals with chronic diabetes.

One possible index variable for physical functioning is employment status. A correlation was carried out between physical functioning and employment status for the experimental group. Results revealed a significant but low

correlation between physical functioning and employment status (r=.37, n=50, p<0.01).

Post hoc analysis of the findings within the retired group were carried out to test if the differences could be explained by age or additional medical problems. Results from t-tests revealed that the age-retired group were significantly older than the ill-health retired group (t=3.08,df 18, p<0.01, 2 tailed) and that the intake of number of medicines was significantly greater in the ill-health retired group than the age-retired group (t=2.33, df 19, p<0.05, 2 tailed). Hence, the differences in physical functioning within the retired group might be explained by additional medical conditions over and above chronic pain.

3.4 Measurement of Negative Affect

The mean score on the anxiety scale of the HADS was 8.38 (S.D.4.59) ranging from 0-21 for individuals with chronic pain. In comparison, the mean score for individuals with chronic diabetes was 6.09 (S.D. 3.77) ranging from 0-14. Forty-six percent (n=23) of individuals with chronic pain and 26 percent (n=12) of individuals with chronic diabetes scored above the normal range for anxiety. Thirty percent (n=15) of individuals with chronic pain and 13 percent (n=6) of individuals with chronic diabetes scored above the normal range for depression.

Results showed that individuals in the experimental group scored significantly higher on the anxiety scale than individuals in the control group ($t=2.64$, df 93, $p<0.01$, 2 tailed).

The mean score on the depression scale of the HADS was 7.2 (S.D.4.82) ranging from 0-21. In comparison, the mean depression score for individuals with chronic diabetes was 4.09 (S.D. 3.77) ranging from 0-14.

A t-test was again carried out to determine if there was a significant difference in depression scores between the experimental and control group. Results showed that individuals with chronic pain scored significantly higher for depression than individuals with chronic diabetes ($t=3.45$, df 93, $p<0.001$, 2 tailed).

Incidence of negative affect, therefore, differed significantly between the two groups. Specifically, individuals with chronic pain scored significantly higher on measures of both anxiety and depression than individuals with chronic diabetes. In addition, the significance of the difference in scores was greater for depression than for anxiety.

A correlation was also carried out within the experimental group data to determine the strength of the association between the anxiety and

depression scores. Results showed that there was a significant and high correlation between the two sets of scores ($r=.79$, $n=50$, $p<0.001$).

Physical functioning was earlier reported as differing signficantly between the experimental and control groups. As anxiety and depression also differed significantly between the groups, the extent to which anxiety and depression correlated with physical functioning was also assessed. Scatter plots are presented of the correlation between both anxiety and depression and physical functioning in Appendix 4.6 and 4.7. Results from a Pearson correlation indicated there was a significant but low correlation between anxiety scores and physical functioning scores ($r=.33$, $n=50$, $p<0.05$) and a significant and moderate correlation between depression and physical functioning scores ($r=.44$, $n=50$, $p<0.01$).

3.5 Social Support

The Significant Others Scale (SOS) measures the discrepancy between perceived levels of support and ideal ratings of support for both practical and emotional support. Form B of the SOS asks respondents to indicate up to seven 'significant others' of their own choosing. Twelve percent (n=6) participants had one significant other, 24 percent (n=12) two significant others, and 30 percent (n=15) three significant others. A further eight

participants had four significant others, four participants had five, two had six and three had seven significant others.

The most common first significant other stated was 'spouse' (n=39). In total, spouse was indicated as a significant other for 84 percent (n=42) of respondents. These included people living as married. Other significant others included children (cited 42 times), parents (cited 26 times), and friends (cited 24 times). Other significant others included siblings, nieces, work colleagues, medical professionals and a carer.

The mean discrepancy score on the emotional support component of the scale for the experimental group was -0.59 (S.D. 1.3) ranging from -4.0 to +4.0, and for the control group was -0.66 (S.D. 1.52) ranging from -3.75 to +4.5. A negative score indicates an shortfall of the received support function over the ideal support function.

The mean discrepancy score on the practical support component of the scale for the experimental group was -0.65 (S.D.1.14), ranging from -4.2 to +2.3, and for the control group was -0.57 (S.D. 1.21), ranging from -3.0 to +4.0.

T-tests were carried out on both the discrepancy score for emotional support and for practical support between the experimental and control groups.

Results revealed no significant differences between the groups on either measure of quality of relationships ((emotional) t=.22, df 93, p=.29, 2 tailed), ((practical) t=.32, df 93, p=.75, 2 tailed).

Despite there being no differences between the groups on quality of emotional and practical support, the impact of that support may vary according to the nature of the condition. Analysis was completed, therefore, of the relationship between both emotional and practical support and anxiety, depression and physical functioning, given that these were variables earlier which distinguished individuals with chronic pain from individuals with chronic diabetes.

Pearson correlations were carried out on the variables noted above. A summary of the results from these correlations is presented in Table 3.3 below. A significant but low correlation was found between the discrepancy score for practical support and physical functioning score (r=.29, n=50, p<.05). No other correlations reached signficance levels. A scatterplot is presented in Appendix 4.8 for the one significant result. Specfically, negative discrepancies, i.e. where received support is less than ideal support, correlated with higher functioning. This means that individuals with chronic pain reported functioning higher when they were given less practical support than what they perceived of as ideal.

Table 3.3: Results of correlations on emotional and practical support, and anxiety, depression, and physical functioning

Support - criterion	r	p
emotional - anxiety	.56	0.90
emotional - depression	.005	0.96
emotional - functioning	.22	0.13
practical - anxiety	.08	0.58
practical - depression	.07	0.60
practical - functioning	.29	0.04*

*p<0.05

Results from analyses of social support suggest that firstly, there were no differences between individuals with chronic pain and chronic diabetes in terms of quality of their relationships. Further, for people with chronic pain, there were no strong relationships found between quality of significant relationships and measures of negative affect and physical functioning.

3.6 Pain-Related Characteristics of the Experimental Group

Data on pain was only collected for the experimental group. The mean duration of pain for participants was 5.3 years (S.D. 8.12) ranging from six months to forty years.

Participants were asked if they were given a diagnosis for their difficulties. Thirty percent (n=15) of participants did not know of a diagnosis. The remaining 70 percent (n=35) of participants stated their diagnosis as presented in Table 3.4 below. From the list of diagnoses, only seven were

associated with a clear disease process. These include, for example, osteoporosis, arthritis, and multiple sclerosis. The remainder of diagnoses, therefore, can be assumed to be non-malignant in nature.

Eighty-four percent (n=42) of the experimental group reported back pain as the main source of pain. A futher six participants reported back and hip pain, two reported leg pain, and one each reported hip, foot and face pain.

Table 3.4: Participants in the Experimental Group's Stated Diagnosis

Diagnosis	Frequency	Percent
disc problem	12	24
arthritis	4	8
fibromyalgia	2	4
sciatica	2	4
wear & tear	2	4
calcium build up	1	2
low back pain	1	2
lumbar strain	1	2
mandibular problem	1	2
ME	1	2
metal fixed tibia	1	2
multiple sclerosis	1	2
osteoporosis	1	2
soft tissue damage	1	2
sore neck	1	2
spina bifida	1	2
tilt on spine	1	2
whiplash	1	2

A measure of the sensory experience of participants was obtained from participants' responses on the short form MPQ There are three classes of words in the questionnaire. There are words that describe the sensory and affective qualities of pain, and evaluative words of overall intensity. For the

purposes of this study, it is the sensory aspect of pain that is of interest because the frame of reference is 'over the past two weeks' which concurs with other measures in the present study. Each of eleven descriptive words was rated by participants on an increasing scale of intensity, for example, none, mild, moderate and severe. The sensory score is the sum of these ratings from 'none' = 0 to 'severe' = 3.

The mean score on the sensory component of the short form MPQ was 14.74 (S.D. 6.84) ranging from 3 to 33.

In order to assess the possible impact of pain on quality of life, the sensory pain measure was correlated with earlier variables that were significantly different between the experimental and control groups. Correlations were carried out, therefore, between measures of pain, and anxiety, depression, and physical functioning.

Results showed a significant but low correlation between pain and anxiety ($r=.36$, $n=50$, $p<0.05$) and between pain and depression ($r=.34$, $n=50$, $p<0.05$). There were no other significant correlations among the variables tested. A summary of the results of these correlations is presented in Table 3.5 below.

Table 3.5: Results of correlations between pain and anxiety, depression and physical functioning

Pain - Criterion	r	p
pain - anxiety	.36	0.011*
pain - depression	.34	0.015*
pain - physical functioning	.27	0.056
pain - emotional support	.13	0.36
pain - practical support	.18	0.20

*p<0.05

These results suggest that the sensory experience of pain has only a weak correlation with negative affect and is unrelated to physical functioning and quality of relationships.

3.7 Determining Predictors of Physical Functioning

Results from the present study found that quality of life was significantly different between individuals with chronic pain and individuals with chronic diabetes. Perceptions of general health, level of anxiety and depression, and physical functioning were also significantly different between the two groups. Furthermore, both physical health and environment domains were signficant predictors of general health for individuals with chronic pain. Physical functioning is the target for treatment in clinical practice, hence an examination of predictor variables was carried out. The variables hypothesised to predict physical functioning were depression, employment

status, and quality of practical support, while pain was not hypothesised to predict physical functioning.

In order to test these hypotheses, a step-wise multiple regression analysis was carried out with physical functioning as the dependent variable. The significant multiple regression data are presented in Table 3.6 below.

Results showed that depression was the largest predictor of physical functioning [R^2=.19, F(1,48)=11.25, p<0.01]. In addition, employment status added further predictive value [R^2=.26, F(2,47)=8.17, p<0.001]. Specifically, higher levels of depression and degrees of employment status (ill-health retired were lower functioning than age-retired, age-retired lower than unemployed, and so on) predicted reduced functioning. Depression alone accounted for 19 percent of the variance on scores of physical functioning. Depression and employment status together accounted for 26 percent of the variance on physical functioning.

Table 3.6: Summaries of step-wise multiple regression analyses predicting physical functioning from depression scores and unemployment status

Criterion	Predictor	Beta	t	F	R^2
psychological	depression	-.44	-3.35	11.25*	.19
environmental	employment status	-.27	-2.07	8.17**	.26

*p<0.01 **p<0.001

3.8 Hypotheses Testing

The first hypothesis in the present study was that individuals with chronic pain would score significantly lower on a measure of overall quality of life than individuals with chronic diabetes. Hypothesis one was supported as participants in the experimental group had signficantly lower scores on the overall quality of life measure than participants in the control group ($t=2.75$, df 93, $p<0.01$, 2 tailed).

The second hypothesis was that individuals with chronic pain would score significantly lower on the physical functioning measure than individuals with chronic diabetes. On the physical functioning measure, participants in the experimental group scored significantly lower than participants in the control group, ($t=2.79$, df 93, $p<0.05$), hence this hypothesis was supported.

Hypothesis three was that the overall quality of life measure would correlate with the physical functioning measure. This hypothesis was supported, as a significant but small correlation was found between the two ($r=.33$, $n=95$, $p<0.001$). However, the size of correlation is too small to conclude there is a clinically significant relationship between the variables. Post hoc analysis was carried out to determine if the overall quality of life measure correlated with physical functioning within the experimental group alone. This also revealed a statistically significant but low correlation ($r=.35$, $n=50$, $p<.01$).

Again, the size of the correlation is too small to conclude there is a clinically significant relationship between the variables.

Hypotheses four to seven were concerned with making predictions of physical functioning for individuals with chronic pain.

Hypothesis four was that depression would be a significant predictor of physical functioning. Results from multiple regression analysis supported this hypothesis [R^2=.19, F(1,48)=11.25, p<0.01].

Hypothesis five was that employment status would be a significant predictor of physical functioning. Again, results from multiple regression analysis supported this hypothesis [R^2=.26, F(2,47)=8.17, p<0.001].

Hypothesis six was that practical support would be significant predictor of physical functioning. This hypothesis was not supported.

Finally, hypothesis seven was that pain severity would not be a significant predictor of physical functioning. This hypothesis was supported.

4 Discussion

4.1 Quality of Life Between Chronic Conditions

This study examined predictor variables of quality of life for people with chronic pain. The first step in the process was to establish whether or not individuals with chronic pain had reduced quality of life when compared with people with another chronic condition. Results supported the first hypothesis. Overall quality of life was significantly lower in the individuals with chronic pain when compared with the individuals with chronic diabetes.

It was important to compare quality of life in people with chronic pain with individuals with another chronic condition. Quality of life for individuals with chronic pain were previously compared to healthy populations (Becker et al 1997, Hopman-Rock et al 1997). This demonstrated the personal burden of chronic pain on the individual. However, it did not consider the impact of the chronicity of the condition quite apart from the pain experience. Chronic medical conditions have several common factors unrelated to the symptomatology of the conditions. These include, for example, increased healthcare use and increased medical treatments compared with the general population (Roy et al 1994, Patrick et al 1995) and increased focus on somatic symptoms (Banks & Kerns, 1996). There are also adjustment

processes involved in coping with a chronic condition (Holzbert et al 1995, McCracken et al 1999).

It was also necessary to select a control group who were relatively stable in their condition (Banks & Kerns, 1996). Stability did not refer to conditions such as diabetes being well controlled in terms of blood glucose levels. Stability referred to individuals who were diagnosed with a medical problem which does not have an expected recovery period in physical terms beyond a six month period. For example, six months post-stroke may be an inappropriate control group if the individual continued to be treated on an inpatient basis for further physical rehabilitation.

In this study, the mean duration of a diagnosis of diabetes in the control group was 15.77 years, ranging from one to 41 years. In comparison, the mean duration of the experience of pain was 5 years ranging from six months to 40 years. Hence, in terms of length of time with a chronic condition, the diabetes group can be considered to be stable in their condition.

Within the control group of individuals with diabetes, the group were also selected on the basis of insulin use. Insulin use signifies a more severe form of diabetes. This is slightly different from insulin dependence. Some individuals with diabetes were treated with insulin but were diagnosed

initially with a less severe form of diabetes which subsequently progressed in severity. For exammple, individuals may initially be treated with diet management alone. If this is ineffective in managing their blood sugar levels, they may progress to a tablet medicine based form of management in addition to diet management. If this is also ineffective, they progress to insulin. Should these individuals' blood sugar levels improve, the reverse process may take place. Other individuals will have received insulin treatment immediately upon diagnosis and are reffered to in previous literature as insulin dependent. No distinction was made between these two types of insulin using diabetes patients in the present study.

It is possible, therefore, that some individuals within the diabetes group were less stable in their condition if they were at a point of progression in the disease process. This may, therefore, be a period of transition and adjustment for them to their treatment regime. Nevertheless, despite this possibility, individuals with pain in the experimental group had significantly reduced overall quality of life when compared with the diabetes control group. Results from the present study showed that physical health was a greater predictor of general health for individuals with chronic diabetes than for individuals with chronic pain. Furthermore, the impact of the environment was also a significant predictor of general health for individuals with chronic pain, but not for individuals with chronic diabetes. This means that the

impact of chronic pain on health-related quality of life is due to more than the health-related aspects of the condition.

Individuals with diabetes may also differ from individuals with chronic pain in the possible progressive nature of the disease. Long term physical complications can develop for people with diabetes. These include liver and kidney function problems, eyesight problems, and circulatory problems resulting in the loss of lower limbs. The incidence of other medical problems in the diabetes group was not assessed in this study. However, even if it is presumed that there were complicating physical factors in the diabetes group, this is not necessarily problematic for comparison between groups given the differences in aetiology of pain in the pain group.

Participants in the pain group were recruited from consecutive attendees at a medical pain clinic. This resulted in a varied population in terms of aetiology of pain. For example, 30 percent of the pain group had no known diagnosis and a further eight percent stated 'wear and tear' and symptoms of soreness as their diagnosis. This suggests that the pain experienced in these participants is non-malignant in nature. The remainder of the sample comprised people with conditions such as arthritis, multiple sclerosis, and osteoporosis. These participants may believe that they are at risk of long term complications associated with their conditions. Also, pain patient populations with non-malignant back pain may hold beliefs that their

condition may worsen, even in the absence of objective evidence of a disease process. The pain and diabetes groups, therefore, may not differ markedly in terms of expectations of the long term outcome of their conditions.

In many ways, therefore, the control group matched the pain group in terms of chronicity. The finding that overall quality of life was significantly poorer in individuals with chronic pain and that perception of physical health contributed 41 percent of the variance in overall quality of life for both groups, suggests that this difference in level of overall quality of life was not due to the chronic nature of the condition. In terms of the concept of quality of life to psychological study, Mead et al (1994) stated that quality of life is not simple the absence of distress but the positive affirmation of the meaning of life. The very fact that some medical conditions are chronic in nature could lead chronicity to be viewed as a contributory factor to psychological distress. Therefore, the difference between the groups in this study was not be due to the psychological distress of having a chronic condition. Indeed, a significant portion of the variance in overall quality of life scores remained to be explained in the results from the present study.

Schipper et al (1996) stated that quality of life involves individuals making a comparison against their own expectation of function. The present study found that individuals with chronic pain had significantly reduced physical

functioning when compared with individuals with chronic diabetes. It is possible, therefore, that individuals with chronic pain perceive a greater discrepancy between their expectation of function and the reality of their condition when compared with individuals with diabetes. This may reflect the difference between the two groups in terms of the understanding and treatment pathways for the conditions. Chronic pain populations are not homogenous groups in terms of aetiology for their pain. In addition, Wikblad et al (1996) suggested that medical problems with clear compensatory treatment methods may not lead to reduced quality of life. Wikblad et al (op cit) found no overall difference in quality of life between individuals with insulin dependent diabetes and a healthy control group.

In addition, Schipper et al (1996) proposed that re-integration into normal living is an approximation for quality of life. It is possible that people with chronic pain evaluate their current condition as representative of their failure to re-integrate into normal living when compared with individuals with diabetes.

One possible measure of normal living is employment for individuals of employable age. Demographic data in this study revealed that 36 percent of the pain group stated they were employed, compared with 51 percent of the diabetes group. Put in unemployment terms, only 3 percent of the diabetes group stated they were unemployed, compared with 10 percent of the pain

group. Forty-two percent of both groups were retired or ill-health retired. In the present study, employment status was correlated with reduced function. Some of this could be explained by additonal medical conditions perhaps experienced by the ill-health retired group. However, while employment is not possible or desirable for everyone, nonetheless employment encompasses functional activity such as purposeful use of time, a structure to the day and opportunity for social interaction.

Certainly, previous research found that lower functioning was associated with poorer health related quality of life among pain patients (Patrick et al, 1995). A history of treatment for back pain in a chronic pain population was also found to be associated with reduced health related quality of life (Patrick et al, op cit). Normal living, therefore, could be viewed as the absence of a positive factor, for example, employment or other purposeful use of time, or the excess of a negative factor, for example, physical treatment.

4.2 Quality of Life Measurement

There are a number of points to make about the quality of life measure. Firstly, the quality of life measure selected for use in this study was a broader measure of quality of life than previous scales of health-related quality of life. That said, the WHOQOL-BREF was described as a health-related quality of life scale (Szabo, 1996). However, the inclusion of social

support and environment domains makes this a more comprehensive assessment. It takes into account, for example, the effects daily activities, disability, and the personal aspirations of individuals in relation to these and other factors.

A majority of participants in the experimental group (84 percent) had back pain as at least part of their clinical presentation. It is useful, therefore, to consider the component parts of the biopsychosocial model for understanding the development of chronic back pain, when assessing the possible relative importance of each of the quality of life domains. The starting point in the model is the sensory experience of pain. This elicits an emotional response and a behavioural response. The emotional response may result in the experience of negative affect. This may lead to a withdrawal from normal activities. This behavioural response could also occur in the absence of a negative emotional response. This is because any activity which is interpreted as a 'cause' of pain may also lead to withdrawal from activity. Further, social interactions may serve to reinforce pain related behaviour linked to inactivity, deskilling, reduced social interaction and increased 'illness' behaviour (Waddell, 1998).

It was possible that the greatest impact on quality of life may have been related to any point in the model, or equally amongst all the domains. Hence all of the domains in the WHOQOL-BREF were worth assessing. However,

of the four domains tested, the only significant predictor of overall quality of life for the individuals with chronic pain was physical health. The same finding applied to the diabetes group. In terms of perceptions of general health, however, both physical health and the impact of the environment were significant predictors for individuals with chronic pain. This suggests that the difference in quality of life between the two groups was not due to perceptions of the importance of physical health. A separate variable altogether must account for the difference in overall quality of life.

No hypothesis was made about which of the domains in the quality of life measure would predict overall quality of life. However, finding that physical health was the only significant predictor of overall quality of life in the pain group is a useful finding in terms of selecting an appropriate quality of life measure for the assessment of this group as a patient population. For example, it is possible to look more closely at individual facets within each domain of the WHOQOL-BREF for more detailed data on the important factors within physical health that contribute to quality of life. Alternatively, as in previous assessments of quality of life in individuals with chronic pain (Patrick et al 1995, Becker et al 1997), health-related quality of life may be an appropriate measure for further investigation.

The SF-36 examines a number of domains in relation to health (Jekinson, Layte, Wright & Coulter, 1996). The most reliable domains, however, in

terms of ability to detect subtle changes in patient status following interventions, were the physical functioning, mental health, and pain domains (Patrick et al, op cit). Given this reliability data, the physical functioning component of the SF-36 was selected as a health-related variable for the study of functioning.

4.3 Physical Functioning

The second hypothesis in this study was that individuals with chronic pain would have significantly reduced physical functioning when compared with individuals with chronic diabetes. This hypothesis was supported. This was an important finding to establish for two reasons. Firstly, multidisciplinary treatment for chronic pain involves helping individuals to maintain or increase their level of physical functioning (Waddell, 1998). It was also an important finding because it goes some way to suggesting a reason for the difference in overall quality of life between the pain group and the diabetes group.

The corollary of physical functioning is disability. Disability was described in terms of a restriction in one's ability to perform normal activities (Waddell, 1996). Again this raises the question of what is normal, this time in terms of activity. The language for describing function was suggested as more straightforward for individuals with chronic pain to express than a description of pain (Waddell, 1996). Reports of reduced function can be put in

quantified terms, for example the ability to walk for 10, 20 or 30 minutes at one time. However, reports such as these remain subjective. It is possible, however, to conclude that individuals with chronic pain perceive that they have reduced function when compared with perceptions of function of individuals in the diabetes group. The emotional and behavioural sequelae to the experience of chronic pain are hypothesised to interact with capacity to perform a physical function and may contribute to reduced function and, therefore, increased disability.

In order to establish this link more firmly, the physical functioning component was examined against the overall quality of life score for level of association. The third hypothesis, therefore, was that physical functioning would correlate with overall quality of life. A statistically significant but low correlation was found between quality of life and physical functioning. This result suggests that perception of physical health and perception of physical functioning are separate constructs. In additon, physical functioning was associated with employment status as stated earlier. It is also possible that some other, as yet unknown, factor moderated the relationship between physical functioning and quality of life. The secondary aim of the present study, therefore, was to examine possible predictor variables of physical functioning within the chronic pain group.

4.4 Negative Affect

The first hypothesised predictor variable of physical functioning was depression. The depression score in this study was obtained from the depression section of the Hospital Anxiety and Depression Scale (HADS). It is important to note that the HADS does not provide an index of caseness for depression and is not a substitute for a clinical interview to determine major depressive disorder. Instead, it provides an indication of the severity of emotional distress. It is also the recommended measure of affective distress for general medical populations because of the absence of somatic symptoms in its assessment (Zigmond & Snaith, 1983).

In the present study, 30 percent of individuals with chronic pain scored above the normal range for depression and 46 percent scored above the normal range for anxiety. These represent a clinially significant level of andxiety and depression. In comparison, 13 percent of individuals with diabetes scored above the normal range for depression and 26 percent scored above the normal range for anxiety. The difference between the two groups on mean anxiety and depression scores was statistically significant. This evidence provides an indication of the negative impact of chronic pain on quality of life that differs from another chronic medical condition.

In comparison, the lifetime prevalence rates for major depressive disorder by DSM-IV diagnostic criteria in pain populations were 30 percent to 54 percent

(Banks & Kerns, 1996). The prevalence rate of depression for other chronic conditions was reported earlier as between zero and 37 percent in diabetes patients (Roy et al 1994, Lustman et al 1997, and Friedman et al 1998), and 7 percent in stroke patients and 14 percent in cardiac patients (Banks & Kerns, 1996). These data demonstrate that depression and anxiety are further indicators of the negative impact on the quality of life of individuals with chronic pain. Results from this study were broadly in line with those above in that rates of anxiety and depression for individuals with chronic pain were higher than for another chronic medical condition.

Results from the multiple regression analyses showed that depression as measured above, was a significant predictor of physical functioning. More specifically, greater severity of depression predicted lower levels of physical functioning. Depression was the single greatest predictor of physical functioning and accounted for 19 percent of the variance on physical functioning scores.

This is an important finding for clinical psychology practice. As stated earlier, multidisciplinary approaches to pain management emphasise the need to maintain or increase level of functioning in individuals with chronic pain (Waddell, 1996). If a significant predictor of functioning is depression, then this implies that presence of depression will limit an individual's ability to apply the tasks required to maintain or increase physical functioning.

Treatment for depression, therefore, would be indicated prior to treatment focusing on physical functioning alone. However, the anxiety score was not entered into the multiple regression equation. The level of significance in terms of the difference between individuals with chronic pain and chronic diabetes was not as strong, although still statistically significant. Also, anxiety and depression scores were highly correlated. Hence, further variance on the physical functioning might have been found with the inclusion of anxiety.

What was not clear from this initial analysis, was the degree of severity of depression which would indicate a clinical psychology treatment path. The HADS might be a useful tool in identifying individuals whose prognosis in terms of physical functioning might be improved by alleviating their low mood in the first instance.

Depression could also be viewed as a risk factor for reduced function if the individual has experienced pain for more than two years (Atkinson et al, 1991). In the present study, several individuals had experienced pain for less than two years. However, individuals with pain for greater than two years did not all have high scores for depression. This suggests that other factors moderated the effects of duration on pain.

Participants in this study were not asked about previous episodes of depression. Therefore, the possibility that depression preceded the onset of pain in this group cannot be assessed. However, existing evidence favours the hypothesis that depression is a psychological reaction to pain (Bank & Kerns 1996, Gaskin et al 1992). Assuming that depression is a consequence of pain, the interest in this study was the impact of depression on functioning. Results showed that depression was the single largest predictor of physical functioning.

It is useful to consider at this point possible psychological explanations for the finding that depression best predicted physical functioning. The cognitive model (Beck 1976), suggested that some individuals may be vulnerable to depression that is activated by a pain stressor. In addition, previous research supported a link between the frequency of general and pain specific cognitive errors and symtpoms of depression (Holzberg et al, 1993). Cognitive errors were also associated with increased disability (Holzberg et al, op cit). Cognitive errors might include for example, black and white thinking, i.e. 'I can either do everything as usual or nothing'. Another example is catastrophising, i.e. 'I'm never going to be able to do anything'. People with chronic pain and depression were also found to have a greater somatic focus than people with chronic pain who were not depressed (Geisser et al (1993). In terms of functioning, people with depression are more likely to interpret bodily symptoms as more threatening

than they actually are. If these individual have also made a faulty link between pain and further damage, then intuitively, their level of functioning will decrease. This suggests that cognitive strategies which alter somatic focus may be a helpful treatment method.

4.5 Employment Status and Physical Functioning

The next section addresses the impact of employment status on physical functioning. The fifth hypothesis of this study was that employment status would predict physical functioning. Results showed that this hypothesis was supported as employment status was indeed a significant predictor of physical functioning. In particular, individuals unemployed were more likely to have reduced functioning than the employed group. The retired group were lower in functioning than either the employed or unemployed groups. The retired group were also separated into the original classificaiton of age retired and ill-health retired. This revealed that the retired group functioned better than the ill-health retired group. It is possible to speculate on why the ill-health retired group had lower functioning than the age-retired group.

Post-hoc analysis of the data revealed a significant but low correlation between level of physical functioning and age for individuals with chronic pain. There were also significant differences in physical functioning between the age retired and ill-health retired groups. This is perhaps not surprising as ill-health retiral implies retirement before an age requirement.

Post hoc statistical analysis revealed that there was a significant difference between the age retired and ill-health retired groups on number of medicines. This does not take into account the frequency of medicine intake, but rather gives an indication of a variety of medicines that are taken in combination. The significant difference in number of medicines taken per day suggests that individuals in the present study with chronic pain have either a more complex pain presentation than age-retired individuals, or additional medical conditions that are treated with medication. The difference in level of functioning between individuals who were age-retired as opposed to ill-health retired may be due, therefore, to medical problems in addition to chronic pain.

In terms of overall results, it is necessary to consider the wider influence of employment status which may contribute to increased psychological distress. Jackson et al (1996) found that unemployed individuals with chronic pain were more poorly adjusted than those in employment. The unemployed individuals with chronic pain reported more financial strain, less structured and purposeful activity and decreased social support. They were also more poorly adjusted psychologically than individuals unemployed but who did not have chronic pain. Further, Jackson et al (op cit) found that reduction in structured and purposeful time was associated with increased distress in unemployed individuals within the general population. Longitudinal analysis

also revealed increased physical functioning, reduced perceived pain intensity and decreased emotional distress upon re-employment (Jackson et al 1998).

It is possible that decreased functioning preceded unemployment and may have contributed to unemployment. However, while poorer physical functioning may be a risk factor for unemployment, the evidence presented above suggests that unemployment may be a cause of further distress (Jackson et al, 1996).

Work ethic values were also assessed in previous research (Jackson et al, 1996). Jackson et al (op cit) found no difference in work ethic values between individuals with chronic pain and healthy controls, both employed and unemployed. However, Jackson et al (op cit), investigated people only involuntarily unemployed. A comparison was made in the present study between employed and non-employed individuals with chronic pain. Results from the present study of the perceived importance of paid work revealed a significant difference between the employed and non-employed groups.

Specifically, the non-employed group rated the importance of employment significantly lower on average on a scale of one to ten when compared with a non-employed group comprising all individuals not in employment whether due to unemployment, age-retirement or ill-health retirement. However, in

terms of predictors of function, paid employment, whether or not viewed as important by the individual, was a significant predictor of physical functioning. In clinical terms, the challenge for treatment for these individuals would be to find a psychosocial and functional equivalent to employment. The group data revealed that employment was a significant predictor of functioning. This suggests that a significant proportion of the group had not established a functional equivalent to paid employment.

The discrepancy between the employed and unemployed sub groups of the chronic pain sample on the measure of importance of paid employment, can be explained in terms of cognitive dissonance (Festinger, 1957). This psychological construct holds that individuals prefer their cognitions about themselves and the world to be consistent. If one of their cognitions is inconsistent, then they become motivated to make them more consistent in order to relieve distress associated with the lack of consistency (Bernstein, Roy, Srull & Wickens (1988). For example, in employment terms, the importance of employment for individuals who believe it is no longer possible, lessens in relation to the degree which they believe it is unattainable.

Another possible explanation for the discrepancy in importance of employment is the individual's stage of life in terms of age and family composition. For individuals for whom employment may be difficult to

sustain or obtain, they may feel they have reached a stage where employment is no longer an option, and therefore, no longer desirable. Previous research found that age and length of time out of work predicted non-return to work after a work focused rehabilitative programme (Gallagher et al, 1989). Gallagher et al (op cit) speculated that time out of work may weaken the employment identity of the individual as well as increase their opportunity for developing skills associated with coping without work.

4.6 Social Support

Social support was also investigated as a predictor variable of function. In particular, actual practical support in excess of ideal levels of practical support was hypothesised to predict lower physical functioning. This hypothesis was not supported from multiple regression analysis. However, there was a significant but low correlation between practical support and functioning. Specifically, individuals with chronic pain who reported a shortfall of received practical support over ideal support had better functioning. The level of the correlation was too small, however, to be conclusive. A number of explanations for this finding are considered below.

The overall measure in the Significant Others Scale was one of quality of significant relationships. The less the discrepancy between actual and ideal support, the better the quality of the relationship. Practical support in adults was found previously to be protective of depression (Lam & Power, 1991) in

an outpatient mental health population. However, perceived high quality relationships are not necessarily helpful for maintaining or improving physical functioning. In chronic pain management, if the relationship involves overprotectiveness, this could lead to deskilling and inactivity in the individual with chronic pain.

It was stated in the introduction that the challenge of applying the stress buffering model to the experience of chronic pain would firstly be to identify appropriate support functions. It is possible that the scale chosen to assess support in this study was not specific enough to assess appropriate support functions for a chronic pain population. Previous research found that perceived social support from a spouse was associated with decreased negative mood and decreased pain (Feldman et al, 1991). In the present study there was no significant assocation between discrepancy scores for emotional support and either anxiety or depression for individuals with chronic pain.

The present study examined the influence of more than one significant other in terms of social support. The effects of excess of practical support by a spouse may have been diluted by the inclusion of other 'significant others'.

Following the identification of appropriate support functions, an assessment of their availability and the extent to which they enhance broadly useful

coping strategies could then be assessed. It is possible, however, that an appropriate support function for effective pain management (i.e. increasing functioning) may involve withholding practical support in order to increase independence in functioning and maintain and develop coping skills. Results from the present study suggest that this is a possible avenue of future research. In terms of quality of relationships, emotional support would need to compensate for difficulties that may arise when practical support is withheld. This would be essential because poor quality of emotional support was a vulnerability factor for depression (Lam & Power, 1991). As stated earlier, the present study found that depression was a predictor of reduced function.

4.7 Pain

In the present study, assessment of the sensory aspect of pain was made only in relation to the experimental group. As stated earlier, the main interest in this study was to determine whether or not overall quality of life was poorer for individuals with chronic pain than for individuals with another chronic medical condition. This was definitively established.

The main focus for clinical treatment of pain, i.e. pain management, was also stated earlier as increasing function (or decreasing disability). Hence, it was important to establish whether or not there was also a difference between

the two groups of individuals with chronic pain on physical functioning. This was also definitively established.

The present study found low correlations between pain and anxiety and pain and depression, but significant differences on both anxiety and depression between individuals with chronic pain and individuals with chronic diabetes. This suggests that pain indirectly influences both anxiety and depression, perhaps via reducing functioning, hence anxiety and depression contribute to poorer quality of life for individuals with chronic pain.

There was also a sizeable portion of the variance in physical functioning that remained to be explained in the present study. In particular, there was some evidence to suggest that anxiety is also an important variable to consider. Previous research found that both depression and anxiety were significant predictors of disability, but that depression was a stronger predictor (Kuch et al, 1993). McCracken et al (1998) also found that while anxiety and depression were significant predictors of physical complaints in a chronic pain sample, pain-related anxiety was the stronger predictor. Pain-related anxiety was also more signficantly related to disability than depression. In the present study, only general anxiety was measured and this may account for the differences in the results from those found by McCracken et al (op cit).

Also, while the variation in levels of emotional and practical support was similar between individuals with chronic pain and chronic diabetes, the impact of that support is potentially very different. A shortfall of actual over ideal practical support is one area needing further investigation. Results from this study suggest that too much practical support can be deskilling. The converse, too little practical support may contribute towards independence. However, it may also damage the quality of emotional support. In the present study, pain was not associated with either emotional or practical support. However, as practical support may influence disability, and pain has been shown to influence disability, then pain and the impact of social support are likely to be related to one another, albeit indirectly.

4.8 Methodological Critique

There are a number of methodological considerations which are important in the assessment of the present study. The first of these concerns the investigation of pain in the experimental group. The duration of pain was investigated, but not pain history in terms of whether pain was intermittent or long-standing constant pain as suggest by Waddell (1998) as a useful classification system. It is possible that the low correlations found between pain and variables such as anxiety, depression, and physical function may have suffered as a result. Pain which is intermittent, for example on a once weekly basis, may be a significantly different experience from pain that is constant and unremitting.

Also, pain conditions were not stratified by aetiology. Common distinctions in the literature are pain due to musculoskeletal disorder, non-malignant pain, or pain due to a particular disease process, for example, osteoporosis. Hence, the homogeneity of the experimental group may again have influenced the results. It is possible that the experience of chronic pain which is part of a clear debilitating disease process is different from that which is clearly not part of a debilitating disease process. There is further middle ground in this as individuals with pain due to no known cause may still believe there is a cause yet to be discovered. No differentiation within the results was made among these groups of individuals.

Much the same criticism can be made in terms of site of pain. The majority of individuals in the chronic pain group had back pain as at least part of their presentation. However, there was also a combination of back and hip pain, hip pain alone and facial pain. Certainly the former sites of pain are likely to influence mobility and in that they have something in common, but facial pain is likely to be markedly different, in particular in relation to physical functioning.

Within the control group, the criterion of insulin use for inclusion in the study encompassed insulin dependence and insulin use that represents a fluid progression in the disease process. No stratification of results was made on

the basis of insulin use versus insulin dependence. This could potentially influence the results from the control group. Insulin use which represents a progression in the severity of a condition may have more negative impacts on quality of life than insulin dependence where a longer period of adjustment to illness may have occurred prior to the present study.

Further criticisms could be made of some of measures used in the study. In particular, use of the Significant Others Scale may have been inappropriate for a chronic pain population when the variable of interest in terms of pain management was practical support. Inclusion of a range of significant others in the study provided valuable information about the quality of relationships among the sample generally, but did not fully assess the impact of practical support on physical functioning.

Also, criticism could also be made of the use of the physical functioning component of the SF-36 as the sole measure of physical functioning. Previous research has supported the use of the SF-36 because of its sensitivity to low levels of disability. However, the items on the physical functioning component of the scale could be seen as too medically focused. Instead, a measure of pain-related disability might be more useful, for example the Roland & Morris Back Pain Disability Scale developed from the Sickness Impact Profile to assess disability in a back pain population (Jensen, Strom, Turner & Romano, 1992), or a standardised scale on

activities of daily living or instrumental activities of daily living, such as the Lawton Instrumental Activities of Daily Living Scale (Lawton & Brody, 1969)

4.9 Conclusion and Future Directions

The overall aim was to establish whether or not individuals with chronic pain had significantly poorer quality of life than individuals with another chronic condition. This was established in several ways. First of all, overall quality of life and health-related quality of life were significantly lower for individuals with chronic pain than another chronic medical condition. The measure employed in the assessment of overall quality of life and health-related quality of life have been extensively validated, hence these results can be stated with confidence.

One of the hypothesised reasons for differences in quality of life was reduced physical functioning as a result of chronic pain. The choice of measure was used in previous research examining physical functioning in pain populations, and in the present studied identified a significant difference between individuals with chronic pain and individuals with another chronic condition in terms of function.

Signficant differences were also found in anxiety and depression between the groups. This provides further evidence that pain has a negative impact on quality of life over and above the chronic nature of the condition.

In terms of the individual's relationship to the wider enviroment, and in particular the employment environment, employment status was also important in terms of quality of life. Individuals with chronic pain experienced differential effects of that pain in terms of physical functioning, depending on where they were in the employment market. As stated earlier, employment is neither always available, possible, or desired by all individuals, and the challenge then is to find functional equivalents to employment to negate some of the negative effects of chronic pain on the individual.

In terms of social support, the quality of social support was not significantly different between individuals with chronic pain and another chronic condition. However, evidence from the present study suggests that the influence of practical support on function and the impact of practical support on emotional support and quality of relationships, warrants further study.

Future study would also benefit from a prospective design, where individuals could be tracked through a period of their pain experience. The variables that interact with that experience may then be more clearly assessed. In conclusion, therefore, it is through the recognition of the unique and personal experience of chronic pain that the nature of the impact of that

experience will be best understood and as a result, managed more effectively with fewer negative outcomes for the individual.

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6 Appendices

Appendix 1 - Questionnaires

Demographic Questionnaire

Hospital Anxiety and Depression Scale

World Health Organization Quality of Life Scale short form

Short Form 36 Health Survey Questionnaire

Short Form McGill Pain Questionnaire

Significant Others Scale (B)

IDNO .....

PSYCHOLOGICAL FACTORS IN CHRONIC PAIN: A COMPARISON WITH DIABETES

CHECKLIST

Exclusions

Learning disability .....
Mental Illness .....
Chronic Pain .....
Other psychological study .....

Accident .....
Legal .....

Information

Information before assessment .....
Questions .....
Consent form .....

Follow-up

Follow-up appt required .....
Follow-up appt accepted .....
Follow-up appt requested
(but not required) .....

Forth Valley Primary Care NHS Trust
Old Denny Road, Larbert, FK5 4SD
Telephone : 01324 570 700 Facsimile : 01324 562 367

DEMOGRAPHIC QUESTIONNAIRE

ABOUT YOU

1 What is your age group?

18-21 / 22-29 / 30-39 / 40-49 / 50-59 / 60+

2 What is your marital status?

Married / Living as Married / Separated / Divorced / Single / Widowed

3 Do you have any children?

Yes / No If ***YES***, how many children under 5? ....., over 5?.....

4 How many years of primary school did you complete? .....

5 How many years of secondary school did you complete? .....

6 How many years of further education did you complete? .....

7. Please state any qualifications that you have .....

.....

8. Please state your post code .....

9. Do you drink alcohol?

Yes / No If ***YES***, how many units per week on average? .....

(1 unit = 1/2 pink beer/lager or 1 glass of wine or 1 measure of spirits)

ABOUT YOUR WORK HISTORY

10 What is your occupational status?

Employed / Unemployed / Retired / Ill-health Retired / Student /

Other (please state) .....

11 Are you currently in paid employment?

Yes / No If ***YES***, what is your job? .....

How many hours per week do you work? .....

If ***NO***, what was your main job? .....

When did you last work at this job?.....

12. On a scale of 1 - 10, please mark how important it is to you to have paid employment

1 --------2 -------3 -------4 --------5-------- 6 -------7 --------8 --------9 ------10
not at all important very important

13 If you were offered a job today, how likely, on a scale of 1 - 10, would you be to take it?

1---------2-------3--------4--------5---------6-------7-------8--------- 9----------10
not at all likely very likely

14 Do you currently claim any type of disability benefit?

Yes / No If ***YES,*** please state the name of the benefit(s) .....

.....

15 Do you currently claim any other type of state benefit?

Yes / No If ***YES,*** please state the name of the benefit(s) .....

.....

ABOUT YOUR MEDICAL HISTORY

16 Were you told the diagnosis for your difficulties

Yes / No If *YES*, please state diagnosis .....

17 Do you experience pain as your main symptom?

Yes / No If ***YES***, how long have you experienced pain?.....

Is your pain constant? **Yes / No**

Does your pain come and go? **Yes / No**

If ***NO***, please state your main symptom .....

18 Please state the medication you take for your condition and how often:

medication ..... how often .....

medication ..... how often .....

medication ..... how often .....

medication ..... how often .....

medication ..... how often .....

medication ..... how often .....

medication ..... how often .....

medication ..... how often .....

Hospital Anxiety and Depression Scale (HADS)

NFER-NELSON
INFORMING YOUR DECISIONS

Name: _____ **Date:** _____

FOLD HERE

Clinicians are aware that emotions play an important part in most illnesses. If your clinician knows about these feelings he or she will be able to help you more.

This questionnaire is designed to help your clinician to know how you feel. Read each item below and **underline the reply** which comes closest to how you have been feeling in the past week. Ignore the numbers printed at the edge of the questionnaire.

Don't take too long over your replies, your immediate reaction to each item will probably be more accurate than a long, thought-out response.

FOLD HERE

A	D		A	D
		I feel tense or 'wound up'		
3		Most of the time		
2		A lot of the time		
1		From time to time, occasionally		
0		Not at all		
		I still enjoy the things I used to enjoy		
	0	Definitely as much		
	1	Not quite so much		
	2	Only a little		
	3	Hardly at all		
		I get a sort of frightened feeling as if something awful is about to happen		
3		Very definitely and quite badly		
2		Yes, but not too badly		
1		A little, but it doesn't worry me		
0		Not at all		
		I can laugh and see the funny side of things		
	0	As much as I always could		
	1	Not quite so much now		
	2	Definitely not so much now		
	3	Not at all		
		Worrying thoughts go through my mind		
3		A great deal of the time		
2		A lot of the time		
1		Not too often		
0		Very little		
		I feel cheerful		
	3	Never		
	2	Not often		
	1	Sometimes		
	0	Most of the time		
		I can sit at ease and feel relaxed		
0		Definitely		
1		Usually		
2		Not often		
3		Not at all		
		I feel as if I am slowed down		
		Nearly all the time		3
		Very often		2
		Sometimes		1
		Not at all		0
		I get a sort of frightened feeling like 'butterflies' in the stomach		
		Not at all	0	
		Occasionally	1	
		Quite often	2	
		Very often	3	
		I have lost interest in my appearance		
		Definitely		3
		I don't take as much care as I should		2
		I may not take quite as much care		1
		I take just as much care as ever		0
		I feel restless as if I have to be on the move		
		Very much indeed	3	
		Quite a lot	2	
		Not very much	1	
		Not at all	0	
		I look forward with enjoyment to things		
		As much as I ever did		0
		Rather less than I used to		1
		Definitely less than I used to		2
		Hardly at all		3
		I get sudden feelings of panic		
		Very often indeed	3	
		Quite often	2	
		Not very often	1	
		Not at all	0	
		I can enjoy a good book or radio or television programme		
		Often		0
		Sometimes		1
		Not often		2
		Very seldom		3

Now check that you have answered all the questions

	A	D
TOTAL		

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WHOQOL-BREF

PROGRAMME ON MENTAL HEALTH
WORLD HEALTH ORGANIZATION
GENEVA

his assessment asks how you feel about your quality of life, health, or other areas of your life. **Please answer all the uestions.** If you are unsure about which response to give to a question, **please choose the one** that appears most ppropriate. This can often be your first response.

lease keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last two eeks.** For example, thinking about the last two weeks, a question might ask:

	Not at all	Not much	Moderately	A great deal	Completely
Do you get the kind of support from others that you need?	1	2	3	4	5

ou should circle the number that best fits how much support you got from others over the last two weeks. So you ould circle the number 4 if you got a great deal of support from others as follows.

	Not at all	Not much	Moderately	A great deal	Completely
Do you get the kind of support from others that you need?	1	2	3	4	5

ou would circle number 1 if you did not get any of the support that you needed from others in the last two weeks.

I.D. number

ABOUT YOU

Before you begin we would like to ask you to answer a few general questions about yourself: by circling the correct answer or by filling in the space provided.

What is your **gender**? Male Female

What is you **date of birth**? _____ / _____ / _____
Day / Month / Year

What is the highest **education** you received?
None at all
Primary school
Secondary school
Tertiary

What is your **marital status**?
Single Separated
Married Divorced
Living as married Widowed

Are you currently **ill**? Yes No

If something is wrong with your health what do you think it is?_____illness/ problem

Instructions

This assessment asks how you feel about your quality of life, health, or other areas of your life. **Please answer all the questions.** If you are unsure about which response to give to a question, **please choose the one** that appears most appropriate. This can often be your first response.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last two weeks.** For example, thinking about the last two weeks, a question might ask:

	Not at all	Not much	Moderately	A great deal	Completely
Do you get the kind of support from others that you need?	1	2	3	4	5

You should circle the number that best fits how much support you got from others over the last two weeks. So you would circle the number 4 if you got a great deal of support from others as follows.

	Not at all	Not much	Moderately	A great deal	Completely
Do you get the kind of support from others that you need?	1	2	3	4	5

You would circle number 1 if you did not get any of the support that you needed from others in the last two weeks.

WHOQOL-BREF

Please read each question, assess your feelings, and circle the number on the scale for each question that gives the best answer for you.

		Very poor	Poor	Neither poor nor good	Good	Very good
(G1)	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2 (G4)	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last two weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
(F1.4)	To what extent do you feel that physical pain prevents you from doing what you need to do?	1	2	3	4	5
F11.3)	How much do you need any medical treatment to function in your daily life?	1	2	3	4	5
F4.1)	How much do you enjoy life?	1	2	3	4	5
F24.2)	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
F5.3)	How well are you able to concentrate?	1	2	3	4	5
(F16.1)	How safe do you feel in your daily life?	1	2	3	4	5
(F22.1)	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about **how completely** you experience or were able to do certain things in the last two weeks.

		Not at all	A little	Moderately	Mostly	Completely
) (F2.1)	Do you have enough energy for everyday life?	1	2	3	4	5
1 (F7.1)	Are you able to accept your bodily appearance?	1	2	3	4	5
2 (F18.1)	Have you enough money to meet your needs?	1	2	3	4	5
3 (F20.1)	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
4 (F21.1)	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5
5 (F9.1)	How well are you able to get around?	1	2	3	4	5

The following questions ask you to say how **good or satisfied** you have felt about various aspects of your life over the last two weeks.

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
6 (F3.3)	How satisfied are you with your sleep?	1	2	3	4	5
7 (F10.3)	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
8(F12.4)	How satisfied are you with your capacity for work?	1	2	3	4	5
9 (F6.3)	How satisfied are you with yourself?	1	2	3	4	5
0(F13.3)	How satisfied are you with your personal relationships?	1	2	3	4	5
1(F15.3)	How satisfied are you with your sex life?	1	2	3	4	5
2(F14.4)	How satisfied are you with the support you get from your friends?	1	2	3	4	5
3(F17.3)	How satisfied are you with the conditions of your living place?	1	2	3	4	5
4(F19.3)	How satisfied are you with your access to health services?	1	2	3	4	5
5(F23.3)	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to **how often** you have felt or experienced certain things in the last two weeks.

		Never	Seldom	Quite often	Very often	Always
6 (F8.1)	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	1	2	3	4	5

THE SHORT FORM 36 HEALTH SURVEY QUESTIONNAIRE (SF-36™)

The following questions ask for your views about your health, how you feel and how well you are able to do your usual activities. If you are unsure about how to answer any questions please give the best answer you can and make any of your own comments if you like. Do not spend too much time in answering as your immediate response is likely to be the most accurate.

1. **In general**, would you say your health is:

*(Please tick **one** box)*

- Excellent ☐
- Very good ☐
- Good ☐
- Fair ☐
- Poor ☐

2. **Compared to one year ago**, how would you rate your health in general now?

*(Please tick **one** box)*

- Much better than one year ago ☐
- Somewhat better than one year ago ☐
- About the same ☐
- Somewhat worse now than one year ago ☐
- Much worse now than one year ago ☐

3. **HEALTH AND DAILY ACTIVITIES**

The following questions are about activities you might do during a typical day. Does your health limit you in these activities? If so, how much?

*(Please tick **one** box on each line)*

		Yes, limited a lot	Yes, limited a little	No, not limited at all
a)	**Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	☐	☐	☐
b)	**Moderate activities**, such as moving a table, pushing a vacuum, bowling or playing golf	☐	☐	☐
c)	Lifting or carrying groceries	☐	☐	☐
d)	Climbing **several** flights of stairs	☐	☐	☐
e)	Climbing **one** flight of stairs	☐	☐	☐
f)	Bending, kneeling or stooping	☐	☐	☐
g)	Walking **more than a mile**	☐	☐	☐
h)	Walking **half a mile**	☐	☐	☐
i)	Walking **100 yards**	☐	☐	☐
j)	Bathing and dressing yourself	☐	☐	☐

4. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

*(Please answer **Yes** or **No** to each question)*

		Yes	No
a)	Cut down on the **amount of time** you spent on work or other activities	☐	☐
b)	**Accomplished less** than you would like	☐	☐
c)	Were limited in the **kind** of work or other activities	☐	☐
d)	Had **difficulty** performing the work or other activities (eg it took more effort)	☐	☐

5. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

*(Please answer **Yes** or **No** to each question)*

		Yes	No
a)	Cut down on the **amount of time** you spent on work or other activities	☐	☐
b)	**Accomplished less** than you would like	☐	☐
c)	Didn't do work or other activities as **carefully** as usual	☐	☐

6. During the **past 4 weeks**, to what extent have your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours or groups?

*(Please tick **one** box)*

- Not at all ☐
- Slightly ☐
- Moderately ☐
- Quite a bit ☐
- Extremely ☐

7. How much **bodily pain** have you had during the **past 4 weeks**?

*(Please tick **one** box)*

- None ☐
- Very mild ☐
- Mild ☐
- Moderate ☐
- Severe ☐
- Very Severe ☐

8. During the **past 4 weeks** how much did **pain** interfere with your normal work (including work both outside the home and housework)?

*(Please tick **one** box)*

- Not at all ☐
- A little bit ☐
- Moderately ☐
- Quite a bit ☐
- Extremely ☐

YOUR FEELINGS

9. These questions are about how you feel and how things have been with you **during the past month**. (For each question, please indicate the one answer that comes closest to the way you have been feeling).

*(Please tick **one** box on each line)*

	How much time during **the last month:**	**All of the time**	**Most of the time**	**A good bit of the time**	**Some of the time**	**A little of the time**	**None of the time**
a)	Did you feel full of life?	☐	☐	☐	☐	☐	☐
b)	Have you been a very nervous person?	☐	☐	☐	☐	☐	☐
c)	Have you felt so down in the dumps that nothing could cheer you up?	☐	☐	☐	☐	☐	☐
d)	Have you felt calm and peaceful?	☐	☐	☐	☐	☐	☐
e)	Did you have a lot of energy?	☐	☐	☐	☐	☐	☐
f)	Have you felt downhearted and low?	☐	☐	☐	☐	☐	☐
g)	Did you feel worn out?	☐	☐	☐	☐	☐	☐
h)	Have you been a happy person?	☐	☐	☐	☐	☐	☐
i)	Did you feel tired?	☐	☐	☐	☐	☐	☐
j)	Has your **health limited your social activities** (like visiting friends or close relatives)?	☐	☐	☐	☐	☐	☐

HEALTH IN GENERAL

10. Please choose the answer that best describes how **true** or **false** each of the following statements is for you.

*(Please tick **one** box on each line)*

		Definitely true	**Mostly true**	**Not sure**	**Mostly false**	**Definitely false**
a)	I seem to get ill more easily than other people	☐	☐	☐	☐	☐
b)	I am as healthy as anybody I know	☐	☐	☐	☐	☐
c)	I expect my health to get worse	☐	☐	☐	☐	☐
d)	My health is excellent	☐	☐	☐	☐	☐

SHORT-FORM McGILL PAIN QUESTIONNAIRE

RONALD MELZACK

	NONE	MILD	MODERATE	SEVERE
THROBBING	0) _____	1) _____	2) _____	3) _____
SHOOTING	0) _____	1) _____	2) _____	3) _____
STABBING	0) _____	1) _____	2) _____	3) _____
SHARP	0) _____	1) _____	2) _____	3) _____
CRAMPING	0) _____	1) _____	2) _____	3) _____
GNAWING	0) _____	1) _____	2) _____	3) _____
HOT-BURNING	0) _____	1) _____	2) _____	3) _____
ACHING	0) _____	1) _____	2) _____	3) _____
HEAVY	0) _____	1) _____	2) _____	3) _____
TENDER	0) _____	1) _____	2) _____	3) _____
SPLITTING	0) _____	1) _____	2) _____	3) _____
TIRING-EXHAUSTING	0) _____	1) _____	2) _____	3) _____
SICKENING	0) _____	1) _____	2) _____	3) _____
FEARFUL	0) _____	1) _____	2) _____	3) _____
PUNISHING-CRUEL	0) _____	1) _____	2) _____	3) _____

NO PAIN |——————————————————————| WORST POSSIBLE PAIN

P P I

0 NO PAIN _____
1 MILD _____
2 DISCOMFORTING _____
3 DISTRESSING _____
4 HORRIBLE _____
5 EXCRUCIATING _____

SIGNIFICANT OTHERS SCALE (B)

Instructions

Please list below up to seven people who may be important in the individual's life. Typical relationships include partner, mother, father, child, sibling, close friends, plus keyworker. For each person please circle a number from 1 to 7 to show how well he or she provides the type of help that is listed.

The second part of each question asks you to rate how individuals would like things to be if they were exactly as they hoped for. As before, please put a circle around one number between 1 and 7 to show what the rating is.

		Never			Sometimes			Always
Person 1 –								
1	a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
2	a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
3	a) Does he/she give you practical help?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
4	a) Can you spend time with him/her socially?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
Person 2 –								
1	a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
2	a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
3	a) Does he/she give you practical help?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
4	a) Can you spend time with him/her socially?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
Person 3 –								
1	a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
2	a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
3	a) Does he/she give you practical help?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
4	a) Can you spend time with him/her socially?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7

PLEASE CIRCLE ONE NUMBER ONLY FOR EACH QUESTION

Person 4 – .....

	Never			Sometimes			Always
1 a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
2 a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
3 a) Does he/she give you practical help?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
4 a) Can you spend time with him/her socially?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7

Person 5 – .....

1 a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
2 a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
3 a) Does he/she give you practical help?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
4 a) Can you spend time with him/her socially?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7

Person 6 – .....

1 a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
2 a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
3 a) Does he/she give you practical help?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
4 a) Can you spend time with him/her socially?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7

Person 7 – .....

1 a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
2 a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
3 a) Does he/she give you practical help?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7
4 a) Can you spend time with him/her socially?	1	2	3	4	5	6	7
b) What rating would your ideal be?	1	2	3	4	5	6	7

PLEASE CIRCLE ONE NUMBER ONLY FOR EACH QUESTION

Power and Champion, 1988. From 'The development of a measure of social support: The Significant Others (SOS) Scale'. *British Journal of Clinical Psychology*. 27. 349–58. Reproduced with the kind permission of the authors.

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Appendix 2 - Information for Participants

INFORMATION SHEET

Psychological Factors and Quality of Life in Pain Study - January - March 2001

I am a Psychologist in Clinical Training at the University of Edinburgh. I am currently attached to the Pain Clinics at Falkirk and District Royal Infirmary and Stirling Royal Infirmary. I am conducting research into the psychological factors that are important to adults with chronic pain. I am writing to all Pain Clinic attendees at both hospitals and I would like to ask you if you would be willing to participate in this study. Before you decide, it is important for you to understand why the research is being done and what it will involve for you. Please take time to read the following information carefully.

Your participation in the study would involve filling in questionnaires about your mood, your experience of pain, and the activities that you are able and not able to do. There are 8 questionnaires in total that should take not more than 30 minutes to complete. I would like you to complete these questionnaires when you attend for your appointment at the Pain Clinic. I will be at the Pain Clinic to help you with this. All your responses are completely confidential. However, after completing the questionnaires, if they indicate high levels of axiety or depression, you will be offered the opportunity, if you wish, to see Marie Fitzpatrick, Clinical Psychologist at the Pain Clinic.

The aim of this study is to help the pain management team, comprised of medical, nursing, physiotherapy and psychological staff, to understand the link between the physical and psychological aspects of chronic pain. This may, in turn, influence and improve the way in which treatments and services are delivered to you. If you are interested in the overall results, at the end of the study I can send you a copy of the summary of my findings.

I would, therefore, appreciate your participation in this research. It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. If you decide not to take part or to withdraw, this will not affect the treatment you receive in any way. Approval for this study to proceed has been granted by the Research Ethics Committee of Forth Valley Health Board.

If you agree to take part in this research then I will let your hospital Consultant and your GP know of your decision.

If you require any further information about the study please do not hesitate to contact me on 01324 574370 or Marie Fitzpatrick, Clinical Psychologist, at the same telephone number. Our address for correspondence is Clinical Psychology Dept, Bungalow 7, RSNH, Larbert. If, as a result of taking part in the study you wish to speak to someone about it, please contact Marie Fitzpatrick at the telephone number above.

Forth Valley Primary Care NHS Trust
Old Denny Road, Larbert, FK5 4SD
Telephone : 01324 570 700 Facsimile : 01324 562 367

P001

INFORMATION SHEET

Psychological Factors and Quality of Life for People with Chronic Pain and Diabetes
March - May 2001

I am a Psychologist in Clinical Training at the University of Edinburgh. I am currently working in health psychology in the Forth Valley Health Board area. I am conducting research into the psychological factors that are important to adults with chronic pain and diabetes. I am contacting all attendees at Diabetes Clinics in Falkirk and District Royal Infirmary and I would like to ask you if you would be willing to participate in this study. Before you decide, it is important for you to understand why the research is being done and what it will involve for you. Please take time to read the following information carefully.

Your participation in the study would involve filling in questionnaires about your mood, your experience of diabetes, and the activities that you are able and not able to do. There are 5 questionnaires in total that should take not more than 20 minutes to complete. I would like you to complete these questionnaires when you attend for your appointment at the Diabetes Clinic. I will be at the clinic to help you with this. All your responses are completely confidential.

The aim of this study is to understand the link between the physical and psychological aspects of pain compared with diabetes. This may, in turn, influence and improve the way in which treatments and services are delivered to you. If you are interested in the overall results, at the end of the study I can send you a copy of the summary of my findings.

I would, therefore, appreciate your participation in this research. It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. If you decide not to take part or to withdraw, this will not affect the treatment you receive in any way. Approval for this study to proceed has been granted by the Research Ethics Committee of Forth Valley Health Board.

If you agree to take part in this research then I will let your hospital Consultant and your GP know of your decision.

If you require any further information about the study please do not hesitate to contact me on 01324 574370 or Marie Fitzpatrick, Clinical Psychologist, at the same telephone number. Our address for correspondence is Clinical Psychology Dept, Bungalow 7, RSNH, Larbert. If, as a result of taking part in the study you wish to speak to someone about it, please contact Marie Fitzpatrick at the telephone number above.

Forth Valley Primary Care NHS Trust
Old Denny Road, Larbert, FK5 4SD
Telephone : 01324 570 700 Facsimile : 01324 562 367

Appendix 3 - Consent Forms

IDNO .....

CONSENT FORM

Psychological Factors and Quality of Life for People with Chronic Pain

Jacqueline O'Neil, Psychologist in Clinical Training

Please tick box

1. I confirm that I have I have read the Information Sheet for '**Psychological Factors and Quality of Life for People with Chronic Pain** and I have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason, without my medical care or legal rights being affected. ☐

3. I agree to take part in the above study. ☐

Name: .....

Signature: ..... ***Date***.....

Address:.....

.....

Consultant Name .....

GP Name & Address .....

Researcher: .....

Signature: .....***Date***.....

Forth Valley Primary Care NHS Trust
Old Denny Road, Larbert, FK5 4SD
Telephone : 01324 570 700 Facsimile : 01324 562 367

IDNO .....

CONSENT FORM

Psychological Factors and Quality of Life for People with Chronic Pain and Diabetes

Jacqueline O'Neil, Psychologist in Clinical Training

Please tick box

1. I confirm that I have I have read the Information Sheet for '**Psychological Factors and Quality of Life for People with Chronic Pain and Diabetes**' and I have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason, without my medical care or legal rights being affected. ☐

3. I agree to take part in the above study. ☐

Name: .....

Signature: ..... ***Date***.....

Address:.....

.....

Consultant Name .....

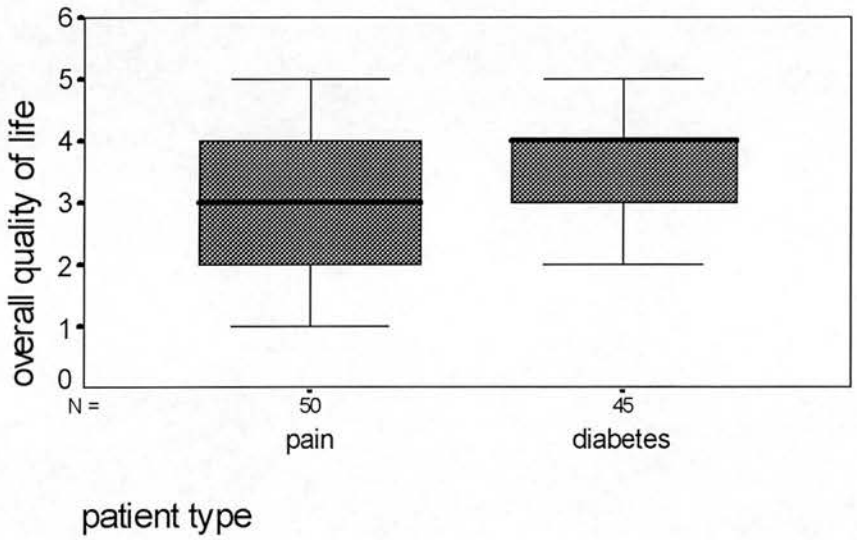
GP Name & Address .....

Researcher: .....

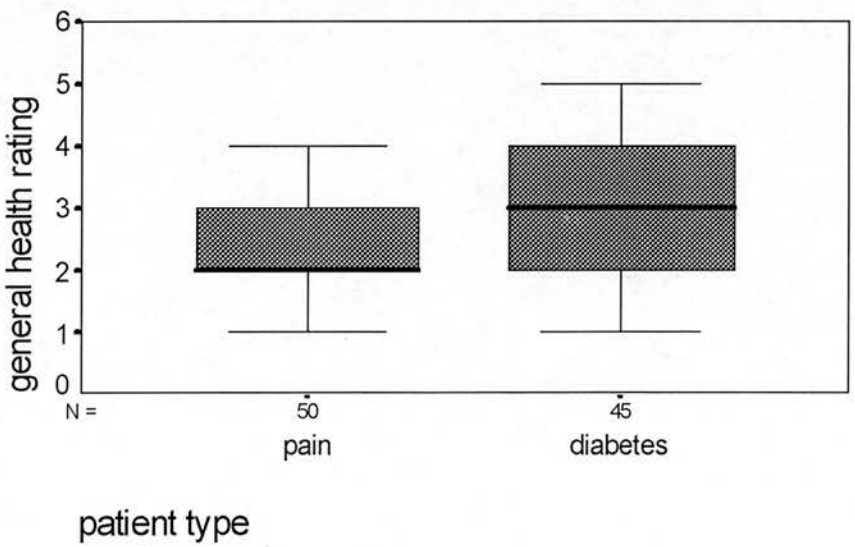
Signature: .....***Date***.....

Forth Valley Primary Care NHS Trust
Old Denny Road, Larbert, FK5 4SD
Telephone : 01324 570 700 Facsimile : 01324 562 367

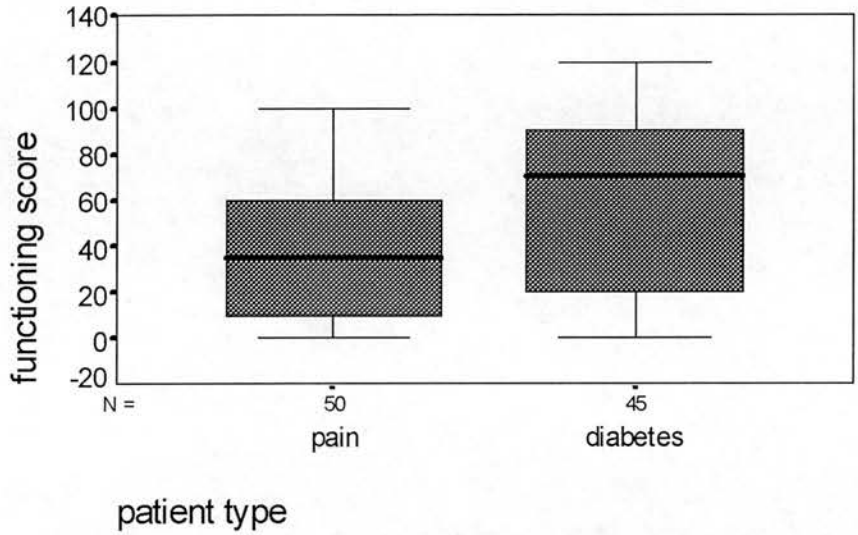
4.1 Box plot: overall quality of life between experimental and control groups



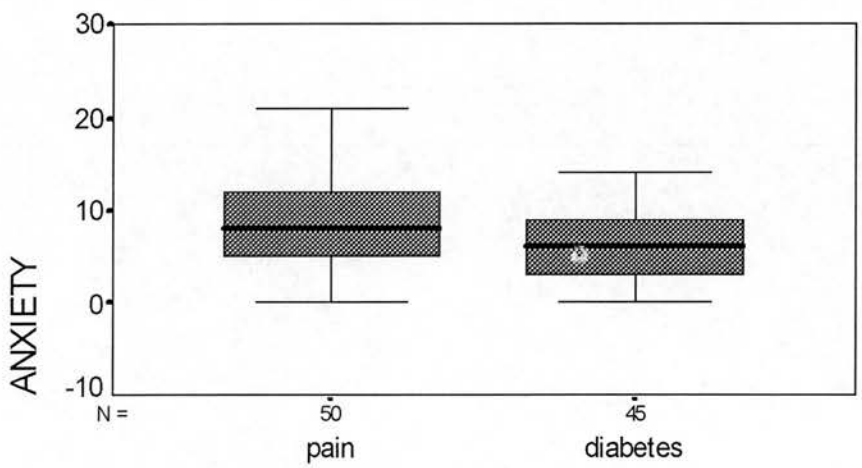
4.2: Box plot: general health domain of WHOQOL-BREF between experimental and control groups



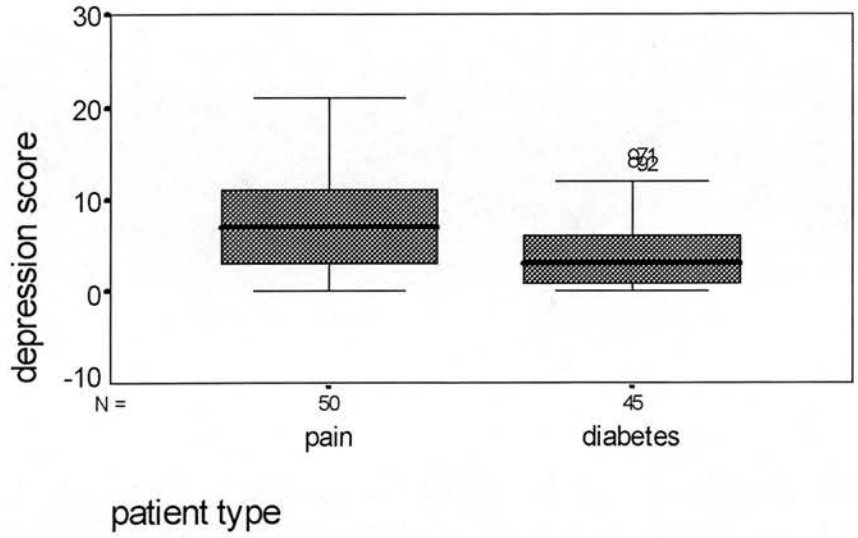
4.3: Box plot: mean scores on physical functioning for experimental and control groups



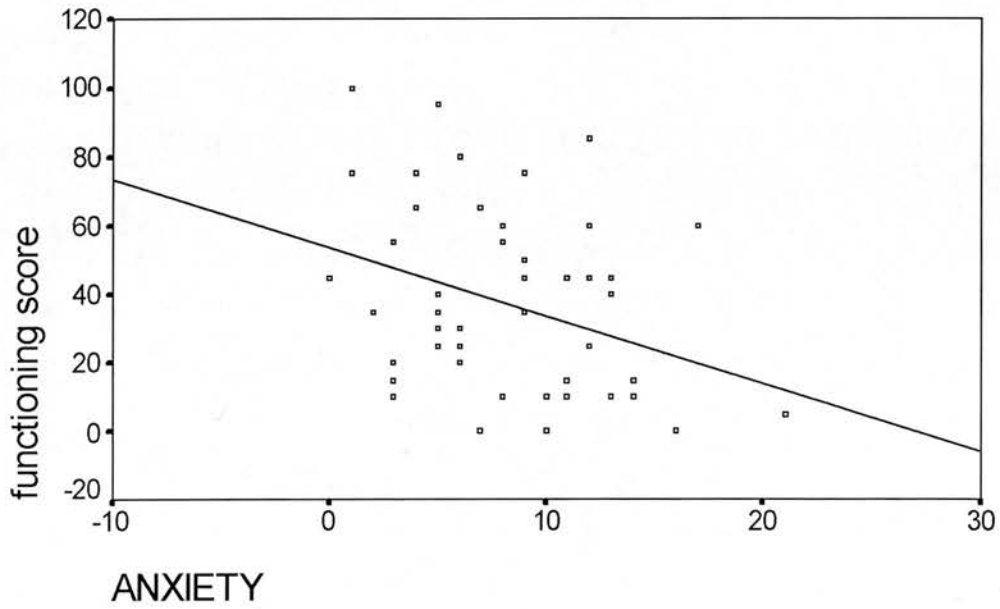
4.4 Box plot: anxiety scores of experimental and control groups



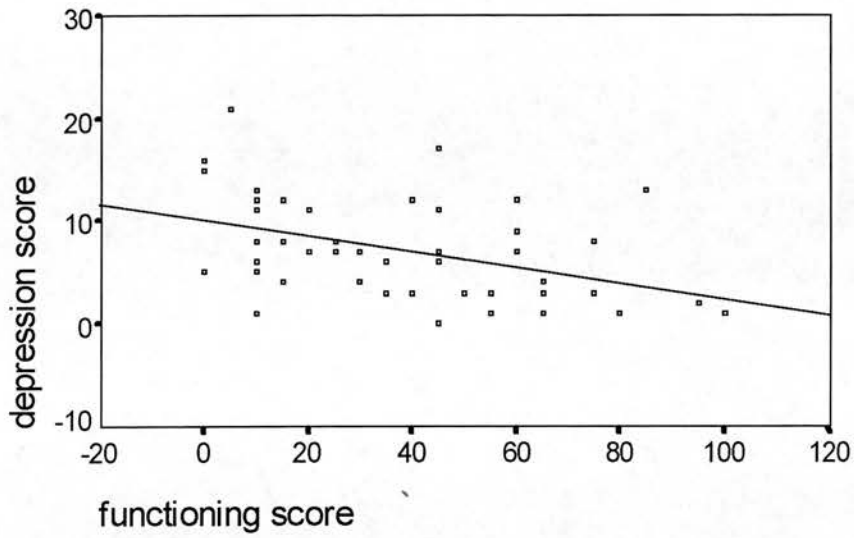
4.5 Box plot: depression scores of experimental and control groups



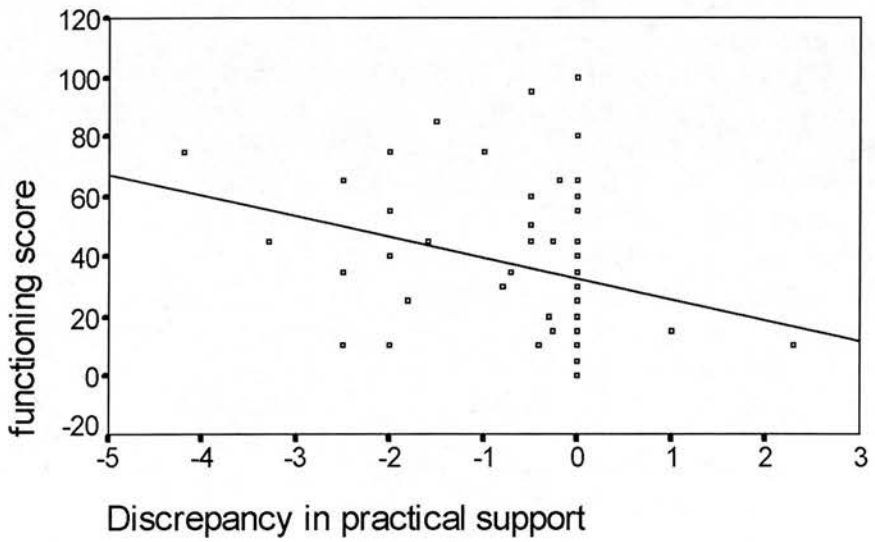
4.6 Scatter plot: anxiety scores by physical functioning scores



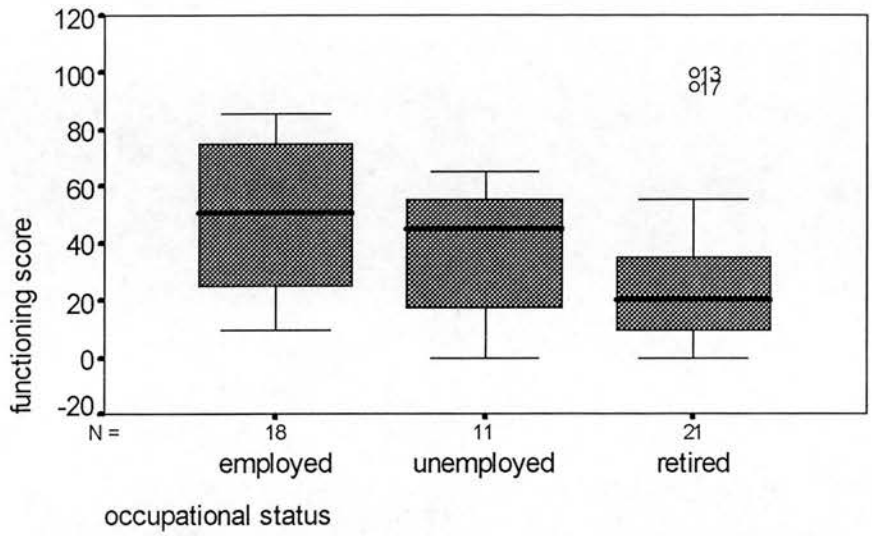
4.7 Scatter plot: depression scores by physical functioning scores



4.8 Scatter plot: Correlation betwee discrepancy in practical support and physical functioning in the experimental group



4.9 Box plot: Differenes in mean functioning scores by occupational category (3 categories)



4.10 Box plot: Differenes in mean functioning scores by occupational category (4 categories)